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The Effects of Personality Traits and Behavioral Characteristics on Schooling, Earnings, and Career Promotion[†]

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Abstract

By analyzing the Japanese and U.S. survey data, this study investigates whether non-cognitive skills, as measured by Big 5 personality traits and behavioral characteristics indicated by risk aversion rate, time discount rate, and (over) confidence, explain the variation in educational and labor market outcomes. The obtained results indicate that non-cognitive skills, as well as behavioral characteristics, account for a significant portion in explaining the variation in schooling, wages, and career promotion. Some interesting country differences, particularly in educational attainment, are found in *agreeableness* and *consciousness*, which may suggest the existence of country-specific, non-cognitive determinants of educational success. With respect to labor market outcomes, in both Japan and the United States, *conscientiousness* seems to contribute to male earnings, whereas *extraversion* and *emotional stability* are more important predictors of female earnings. For career promotion, *extraversion* is an important determinant for the probability of being promoted to a management position among males in both countries. The overall findings suggest that personality traits are associated with educational and career success to different degrees between countries and genders.

Keywords: Big 5 personality, Agreeableness, Consciousness, Behavioral variables, Egalitarianism
JEL Classification: D03, J24

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1. Introduction

While it is widely recognized that measured cognitive ability is a strong predictor of educational outcomes and career success, in both practice and research, less attention has been given to the role of non-cognitive skills in explaining life outcomes. Heckman (1999) has, however, argued that a serious bias can arise if only cognitive skills—as measured by test scores or IQ index—are taken into consideration in evaluating accumulated human capital, excluding non-cognitive skills, such as motivation and social adaptability. Some evidence suggests that, in standard earning equations, years of schooling and work experience, in addition to demographic variables—including family socioeconomic status—can explain approximately 20-30% individual earnings (Bowles, Gintis, & Osborne, 2001). This implies that much of the variation in the labor market success is left unexplained.

Several studies have recently focused on non-cognitive skills as an important predictor for educational attainment (Borghans, Meijers, & ter Weel, 2006; Heckman, Stixrud, & Urzua, 2006) and earnings (Heineck & Anger, 2010; Carneiro, Crawford, & Goodman, 2007; Muller & Plug, 2006). Heckman et al. (2006) have found that improvements in personality traits, self-control, and self-esteem in particular, from the 25th to the 75th percentile of its distribution, while holding the level of cognitive skills constant, increase the probability of being a four-year college graduate at age 30 by approximately 25 percentage points. Big 5 personality traits, in particular *conscientiousness* and *openness to experiences*, proved to be the best personality predictors of educational performance and years of education, respectively (Borghans et al., 2006). There are numerous studies on the importance of non-cognitive skills in the labor market outcomes. For example, Heckman et al. (2001) have argued that when controlling for measured ability, those who obtained high school certification through the GED (General Educational Development) in the US tend to earn less than do high school dropouts. The authors explain that the lack of non-cognitive skills, such as discipline, patience, and motivation accounts for the lower earnings compared to the dropouts of the same ability.

Economic preferences have been studied, as they are deemed important in explaining individual heterogeneity in later life outcomes. Some evidence has proven the importance of behavioral variables, in particular those associated with risk aversion and time preferences, on educational and labor market outcomes (Almlund, Duckworth, Heckman, & Kautz, 2011). Becker, Deckers, and Dohmen (2012) analyzed the relationship between economic preferences and personality traits, and their findings reveal that they play a rather complementary role in explaining the life outcomes. Bartling, Fehr, Marechal, and Schunk (2009) investigated the relationship between self-selection into competition and behavioral and personality traits. Their main finding is that egalitarian individuals are less inclined to self-select into competitive environments, which leads to potentially large payoff inequalities. Moreover, the estimation results pertaining to the correlation with the behavioral characteristics suggests that less risk averse and overconfident subjects, those with higher task-related

skills, and individuals that possess *agreeableness* to a lesser degree prefer to put themselves in a situation where they have to compete with others. As competition is one of the most decisive elements in economic life and is strongly associated with the labor market outcomes, the degree of competition can be one of behavioral characteristics that we need to focus on when identifying heterogeneity in economic success.

The main motivation behind the use of personality traits and behavioral characteristics is that, since a single measure cannot predict much of the variance in the educational and labor market outcomes, these soft skills, in addition to some other factors that govern human behavior, can explain the variance in the outcomes that cannot be attributed to the effect of cognitive skills. According to Borghans, Golsteyn, Heckman, and Humphries (2011), the personality traits are incrementally valid in explaining the variance in educational outcomes, as measured by achievement tests and grades, when these academic outcomes are decomposed into IQ and personality. Using German data, Almlund et al. (2011) explained that *consciousness*, which has been considered as the best predictor for the outcomes in one's later life, has more explanatory power than intelligence.

The importance of non-cognitive skills has been proven by some school programs and government policies. Chetty, Friedman, Hilger, Saez, Schanzenbach, and Yagan (2011) found that non-cognitive skills, fostered by the change in school system, have greater long-term effects on later outcomes than do cognitive skills. Heckman and Kautz (2012) also emphasized that several public policies that enhance soft skills have been proven to have effects on the educational outcomes of children. For example, the Perry Preschool Program for the disadvantaged young children has been demonstrated to have a long-term effect on life outcomes because of the development of non-cognitive skills. Compared to cognitive ability, non-cognitive skills are responsive to parental behaviors and this makes substantial room for parental investments in education and policy interventions (Almlund et al., 2011).

This study differs from the extant research in this field in several ways. First, since different studies use different measures of personality traits, it is difficult to examine country differences. Thus, in this study, the survey data from Japan and the US, which has been collated using the same method and in the same year, is used. Moreover, as many studies report only simple correlations or simple standardized regression coefficients, such estimated relationships do not control for other factors that may influence outcomes. Thus, in the analyses conducted in this work, the same variables are used and multiple regressions are run while controlling for other behavioral factors that affect outcomes, as well as cognitive ability and other socioeconomic variables.

The study aims to analyze the predictive power of personality traits and the mechanisms behind the relationships between the personality traits and later outcomes, while taking into consideration country and gender differences. The focus of this study is on investigating the extent to which non-cognitive skills, as indicated by Big 5 personality traits, explain variations in educational and

labor market outcomes after controlling for socioeconomic variables. The remainder of the paper is organized as follows. Section 2 presents a review of the extant studies in relation to the current study, while the dataset used is discussed in Section 3, which also explains the method of construction of the variables used for the subsequent analyses. The estimated results are presented in Section 4, and are followed by the implications of this study, discussed in Section 5. Finally, Section 6 concludes the paper, while offering some suggestions for future work in this field.

2. Background literature

While much of the variation in the labor market success is left to be unexplained (Bowles et al., 2001), several extant studies have attempted to elucidate how the personality traits act as important predictors of educational and labor market outcomes. As measures of non-cognitive skills, the Big 5 personality traits are a broadly accepted model of personality in the psychology and economics literature. As a brief measure of the Big 5 personality traits, many recent studies use five- or ten-item inventories calculated by bipolar factor of five personality facets, namely *extraversion, agreeableness, conscientiousness, emotional stability*, and *openness to experiences.* Gosling, Peter, William, and Swann (2003) examined (i) their validity, using self, observer, and peer ratings; (ii) the pattern of external correlates, using self-ratings on other measures; and (iii) test-retest reliability, by conducting a second assessment of the same participants. The authors conclude that five- and ten-item inventory can be used as reasonable proxies for longer Big 5 instruments.

Research on personality traits often encounters the controversy pertaining to the stability of the personality traits. Some studies indicate the presence of a monotonic increase in the level of personality traits over the individual's lifecycle (Roberts & Jackson, 2008). It has been, however, widely accepted that personality traits tend to be stable in adulthood. Almlund et al. (2011) reviewed the stability of personality traits and their predictive power, leading to claims that personality development tends to stabilize around the age of thirty (Caspi, 1997; Soldz & Vaillant, 1999). Cobb-Clark and Schurer (2012) also concluded that the personality traits at working age are stable over a four-year period, based on their findings of small changes in average personality during the given periods and no relation between intra-individual personality characteristics and life events.

The following two sections review the personality traits that have been previously shown to best predict the later life outcomes, with the explanation of the mechanisms behind those associations. However, it should be noted that the results of the association between personality traits and later outcomes vary by the survey data and analysis methodologies and many findings are still based on a simple regression or correlation, rather causal relationship.

2.1 The predictive power of personality traits on education

Many studies have investigated to what extent individual variation in educational outcomes—such test scores, GPAs, and total years of schooling—can be explained by non-cognitive skills. Two of the Big 5 traits—*conscientiousness* and *openness to experiences*—are found to be particularly important determinants for how many total years of education individuals complete in their lifetimes. In addition, *emotional stability*, as measured by locus of control and self-esteem, is found to be an important indicator for adolescent schooling decisions (Almlund et al., 2011).

Conscientiousness has been known to be the most predictive Big 5 trait across many outcomes (Hampson, Goldberg, Vogt, & Dubanoski, 2007; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Poropat, 2009); in particular, it is found to be the most consistently linked to the academic success (O'Connor & Paunonen, 2007). Almlund et al. (2011) analyzed a representative sample of Germans aged 21 to 94, and their study findings indicate that the variation in years of schooling is best explained by the degree of *conscientiousness*, even after intelligence is adjusted for. According to the authors, it is particularly interesting to note that this trait has more explanatory power than intelligence. In addition, it is noteworthy that the strong predictive power of *conscientiousness* is more noticeable among males than females. As *conscientiousness* is often associated with motivation, the positive correlation between *conscientiousness* and educational attainment may suggest that more motivated students perform better than their less motivated counterparts.

Many previous studies that examined the role of *openness to experiences* as a predictor of academic performance have indicated presence of positive association between this trait and GPA and final course grades (Lievens, Dilchert, & Ones, 2009; Lounsbury, Sundstrom, Loveland, & Gibson, 2003). The mechanisms behind the positive relationship are often explained by the positive correlation between *openness to experiences* and the measures of intelligence (Chamorro-Premuzic & Furnham, 2005). Ackerman and Heggestad (1997) also explained that *openness to experiences* is the only Big 5 factor with moderate associations with general intelligence (r = 0.33, as measured in a meta-analysis). As intelligence is a strong predictor of educational outcomes, it is easy to appreciate why *openness to experiences* has a positive effect on educational attainment.

Emotional stability is also predicted as an important measure for the educational attainment. Heckman et al. (2006) found that *emotional stability* increased probability of graduating from high school for males at the lowest quantiles of the personality distribution. *Emotional stability* (*low neuroticism*), which is linked to two traits—locus of control and self-esteem—seems to play an important role in adolescent educational decisions. This trait has been often interpreted as the ability in relation to "stress reaction" or to "debilitating anxiety" (Chamorro-Premuzic & Furnham, 2005). Moreover, in studies that used representative sample of US (Goldberg, Sweeney, Merenda, & Hughes, 1998), Dutch (van Eijck & de Graaf, 2004), and German (Almlund et al., 2011) individuals, it was found to be positively correlated with education. Several extant studies used the locus of control as a measure of *emotional stability* and their findings indicate presence of a significant positive

relationship with high school graduation (Baron & Cobb-Clark, 2010; Cebi, 2007; Coleman & DeLeire, 2003).

In contrast, *extroversion* and *agreeableness* are not consistently associated with academic performance (O'Connor & Paunonen, 2007). According to some conflicting findings, extrovert children tend to perform better at school until the age of 12 (Goff & Ackerman, 1992), while introvert students achieve higher grades (Yates, Yates, & Lippett, 1995). Some recent studies suggest the presence of the positive effect of *agreeableness* on the educational outcomes, such as GPA (Farsides & Woodfiled, 2003; Gray & Watson, 2002), and final course grades (Conard, 2006), while findings of other studies suggest that there is no significant correlation, or there is a significant, but negative correlation between *agreeableness* and educational attainment (Goldberg et al., 1998; van Eijck & de Graaf, 2004).

2.2 The predictive power of personality traits on labor market outcomes

The predictive power of personality traits varies across types of labor market outcomes. However, it is widely accepted that *conscientiousness* is the best predictor for the economic success, whereas *emotional stability* (high neuroticism) is often positively (negatively) associated with labor market outcomes. *Conscientiousness* is associated with being well organized, hard-working, and achievement-oriented, and best predicts overall job performance and wages across occupational categories, while the predictive power of intelligence declines as jobs become more complex (Almlund et al., 2011). In particular, males with high degree of *conscientiousness* seem to earn higher wages and are more likely to be promoted (Judge, Higgins, Thoresen, & Barrick, 1999). In addition, as *emotional stability* was shown to affect job search efforts (Almlund et al., 2011), more emotionally stable individuals are more motivated to find the job that fits their abilities and skills. The importance of *emotional stability* was also studied by Semykina and Linz (2007), who analyzed the Russian data and found that 8% of the gender wage gap was explained by the variation in personality traits, as measured by locus of control.

The relationship between two traits of *conscientiousness* and *emotional stability* and labor market outcomes has been found in some recent studies. Duckworth and Weir (2010) used the US data and reported that more conscientious and emotionally stable adults attained higher lifetime earnings. More specifically, the authors found that a one standard deviation increase in *conscientiousness* and *emotional stability* was associated with a 9% and 5% increase in lifetime earnings, respectively. Similarly, Judge et al. (1999) found that, when controlling for childhood IQ, the strongest predictor of a composite measure of self-reported income and occupational status was childhood *conscientiousness*, the effect size of which was higher than that of childhood IQ. According to Uysal and Pohlmeier (2011), these two traits are associated with unemployment duration, suggesting that workers' personality traits can drive their job search intensity.

In addition to *conscientiousness* and *emotional stability*, Fletcher (2013) highlighted the importance of *extraversion* as a predictor for the economic success, using a national sample of siblings and twins. He explained that it is important to consider individual heterogeneity in unobserved generic ability of both cognitive and non-cognitive skills, as the findings of previous heritability studies indicated that measures of personality traits tend to be about 40%–60% heritable, suggesting that genetics have a significant effect on human behavior (Bouchard & Loehlin, 2001). The results indicating the strong association between *extraversion* and earnings were obtained after adjusting for individual heterogeneities related to family background, occupational sorting, and educational attainment.

3. Data and Methodology

3.1 Data

This study is based on the data obtained from a survey entitled "Preference and Life Satisfaction Survey", conducted by the COE (Center of Excellence) project of Osaka University. The data is sourced from the two questionnaire surveys conducted in Japan and the US. This survey was conducted first in Japan, in February 2004, using a random sample drawn from 6,000 individuals selected by the double stratified random sampling method. It has since been conducted annually and a new sample was added to the 2006 and 2008 survey by mailing method. In the US, a panel survey began in January and February of 2005, which included 12,338 individuals and has since been in use. For the present analyses of both the Japanese and the US data, the 2012 survey data was mainly used. The personality traits and labor market outcomes were measured in year 2012, while total years of schooling and some of the behavioral characteristics were sourced from the 2011 and 2010 surveys conducted in both countries.

3.2 Big 5 Personality

In the present study, Big 5 personality traits are measured based on the responses given to the self-report questionnaire. The questions and variables are adapted from Gosling et al. (2003). There are ten questions measuring five different facets of personality traits. Each of the ten items was rated on a 7-point scale, with the responses ranging from “strongly disagree” (1) to “strongly agree” (7). The average of the two bipolar items that make up each scale is then calculated and used in the subsequent analyses. For example, if a respondent has scores of 5 on item 1 (Extroverted, enthusiastic) and 2 on item 6 (Reserved, quiet), the reverse-score for item 6 is first recoded by replacing the 2 with a 6. Second, the average of the score for item 1 and the (recoded) score for item 6 is calculated. The final *extraversion* scale score in this example would be: $(5 + 6)/2 = 5.5$

	I see myself as..	Big 5 Personality
Item1	Extraverted, enthusiastic	Extraversion
Item2	Critical, quarrelsome	Agreeableness (Reversed)
Item3	Dependable, self Dependable	Conscientiousness
Item4	Anxious, easily upset	Emotional Stability (Reversed)
Item5	Open to new experiences, complex	Openess to Experiences
Item6	Reserved, quiet	Extraversion (Reversed)
Item7	Sympathetic, warm	Agreeableness
Item8	Disorganized, careless	Conscientiousness (Reversed)
Item9	Calm, emotionally stable	Emotional Stability
Item10	Conventional, uncreative	Openess to Experiences (Reversed)

Source: Gosling et al. (2003)

Although single-item scales are usually psychometrically inferior to multiple-item scales, Burisch (1997) and Gosling et al. (2003) showed that short and simple depression scales can be just as valid as long and sophisticated ones. In addition, Epstein (1979) presented compelling evidence supporting the view that, averaging over tasks and situations at a point in time, people behave in a predictable pattern with a high level of reliability of average behavior ("measured personality") across situations. These previous studies support the validity of Big 5 personality traits as a measure of non-cognitive skills affecting educational and labor market outcomes. As explained in the Introduction section, the stability of personality traits has been controversial, thus questioning the legitimacy of using this premise when analyzing the personality traits in relation to school and labor outcome in the later life span. There are, however, some authors that claim that personality development tends to stabilize from the age of thirty onwards (Caspi, 1997; Soldz & Vaillant, 1999). In their study, Cobb-Clark and Schurer (2012) also found that the personality traits at working age were stable over a four-year period and did not vary significantly under any life events. In this spirit, in this paper, we treat the personality as invariant over an individual's lifetime.

3.3 Behavioral Characteristics

First, the effect of egalitarianism on the educational and career success is investigated. Egalitarianism is found to be negatively correlated with the self-selection into competitive environments (Bartling et al., 2009; please see Appendix 1). Following the study conducted by Bartling et al. (2009), this analysis begins by constructing the degree of individual egalitarianism, using the following scenario. "You and a complete stranger happen to receive money. There are two ways to divide the money. You will make a decision regarding how to divide the money and the stranger will not know about it. Please indicate either Option 'A' or Option 'B' for all 4 cases." As shown in the table below, two choices between egalitarian and unequal distributions favored the decision-maker or the stranger. The decision-maker can decide how to divide the money without

incurring any costs, as the other individual is not informed of the decision made by the respondent. In this study, a binary indicator equals to 1 if the respondent chose Option A throughout all four hypothetical questions and 0 otherwise.

Hypothetical Questions (Unit: Dollars)	Option A (Self:other)	Option B (Self:other)
Prosociality	10:10	10:6
Costly prosociality	10:10	16:4
Envy	10:10	10:18
Costly envy	10:10	11:19

Source: Bartling et al. (2009)

Second, the effect of (over) confidence on educational attainment and career success is examined. In order to conduct this assessment, at the start of the survey, the respondents are asked to indicate how much they are knowledgeable about sports. Their answers—indicating the level of agreement with the statement "I know a lot about sports"—are coded, ranging from "strongly agree" (1) to "strongly disagree" (5). This response range is rescaled, so that the highest value (5) is associated with "strongly agree". At the end of the survey, four true/false questions about sports are given to the respondents. For example, they are asked to assess the statement "Chicago was a candidate city for the 2016 Summer Olympics." The strategy employed in measuring the overconfidence was based on testing the extent of difference between self-confidence and practical knowledge. This was achieved by asking a simple question first and the applied questions after some reasonable time has lapsed. Based on these scores, the respondent was defined as overconfident (and assigned the value of 1) if the level of self-confidence (1 through 5) was higher than the total score achieved on the practical questions.

The analysis also controls for risk aversion and time discount rate that are thought to determine individual behaviors. The degree of risk taking is measured from the answer to the question, "Which of the following two ways would you prefer to receive your monthly income? (i) your monthly income has a 50% chance of doubling, but also has a 50% chance of decreasing by 30%, or (ii) your monthly income is guaranteed to increase by 3%." Under each of these two choices, the respondents need to answer to two sub-questions about individual preferences related to risk aversion. From these four different question sets, the variable of risk aversion is constructed to represent how risk-averse the respondents are in regards to the way to receive the monthly wages. Second, the time discount rate is calculated from the responses to eight options that correspond to the annual interest rates of -10%, 0%, 10%, 40%, 100%, 200%, 300%, 1000%, and 5000%, respectively (see Appendix 1 for more details).

3.4 Empirical Framework

We investigate the effects of personality traits on a wide range of subsequent life outcomes. First, the educational attainment is measured as years of schooling, while the economic performance is measured by one's own annual income in the logarithmic form. The career promotion is a binary variable that equals one if the respondent is in a management position at the time of survey and zero otherwise. Two dependent variables are used for the career promotion analyses, which are derived from two identical questions that are included in the Japanese and the US survey. However, because of seemingly misleading translations, these questions may have been understood somewhat differently by the Japanese and US respondents. While this does not imply that these variables cannot be used as proxies for career promotion, direct comparison on each question between countries should be attempted with caution. The first dependent variable (Promoted to management position (=1)) is constructed by asking the respondents to the Japanese survey to indicate whether they have been promoted to a position of manager, director, or board member of a private company or governmental office, while in the US survey respondents were given the options of "management, business, and financial operations". The second dependent variable (Management / Executive (=1)) is constructed by asking the respondents to the Japanese survey to indicate whether they hold the position of a company executive or a board member, which is translated into "Management Position" in the US survey.

Taking into consideration the finding that the stability of personality development is reached from about the age of thirty onwards (Caspi, 1997; Soldz & Vaillant, 1999), the sample is restricted to those aged 30 to 65 for all estimations. The base models are defined as follows:

$$y_i = \theta_0 + \sum_{n=1}^{5} \theta_n \, \text{Personality}_i + X_i\pi + \varepsilon_{i1} \qquad (1)$$

$$y_i = \gamma_0 + \sum_{n=1}^{5} \gamma_n \, \text{Personality}_i + \gamma_6 \text{CognitiveA} + X_i\varphi + \varepsilon_{i2} \qquad (2)$$

$$y_i = \delta_0 + \sum_{n=1}^{5} \delta_n \, \text{Personality}_i + \sum_{m=6}^{10} \delta_m \, \text{Behaviroal}_i + \theta_{11} \text{CognitiveA} + X_i\mu + \varepsilon_{i3} \qquad (3)$$

where y_i represents later outcomes: years of schooling (9~21 in Japan and 9~23 in the US), individual annual income (logarithm form), and career promotion (=1). X_i includes the following variables: age, age squared, and gender (which are controlled for in the analysis of educational attainment); years of potential experience and its squared, occupation, type of employment, company size, and years of employment at the current work place, gender (controlled for economic performances). Schooling and earnings are estimated by OLS, and career promotion by Probit.

In Equation (2) and (3), cognitive ability—as measured by parental educational attainment (for educational attainment) and one's own educational attainment (for labor market outcomes)—and behavioral characteristics are additionally included into the base model (1). Equations (1) through (3) are formulated to assess the extent to which the coefficients of personality traits change, as

alternative sources of unmeasured heterogeneity are included. Adding to these base models, in order to investigate the effects of personality traits on the probability of attaining higher educational level, educational attainment is measured as a binary variable that equals 1 if the respondents entered college (or graduate school). Similarly, the nonlinearity of the effects on earnings is assessed by conducting quantile regressions based on Equation (2). All estimations are carried out separately for males and females to examine presence of any gender differences, in addition to the country difference. In the case of the US, as some studies pointed out the difference in later outcomes between races (Fletcher, 2013), the main estimations are conducted with race dummies. While these results are given in Appendix 2, the main findings do not differ after controlling for the respondents' race.

4. Estimation Results

4.1 Descriptive statistics

Figure 1 includes two histograms that represent a frequency distribution of Big 5 personality traits in Japan and the US. Japanese people have comparatively high degree of *agreeableness*, whereas Americans score higher on the *conscientiousness* trait. The mean values of each personality trait are presented in Table 1. Similarly, the difference in personality traits by gender indicates that females are more agreeable and extraverted, while males are more emotionally stable and open to new experiences (Table 1). A part of this trend is consistent with the findings of previous studies of gender differences in personality, which have indicated that females typically have lower degree of *emotional stability* and *openness to experiences* (Feingold, 1994; Costa, Terracciano & McCrae, 2001).

Using the minimum number of years required to attain each educational level, we obtained the values of 13.39 for Japanese and 14.43 for Americans as for the mean number of years of schooling. In addition to the continuous measure for the educational attainment (years of schooling), the transition to tertiary education was also examined in our study. In our samples, 27 percent of Japanese and 39 percent of Americans decided to attain college education, and 2 and 13 percent further continued to graduate school across all age groups, respectively. In addition, 12 and 15 percent of the entire Japanese and American samples, respectively, indicated that they have been promoted to management position, while 5 percent and 12 percent are currently in management, executives or board in Japan and the US, respectively. Finally, in the US sample, 9% of those in management/executives position were females, whereas in Japan, the female managers account for only 2% of the female labor force.

4.2 Educational Attainment

First, Table 2 presents the results pertaining to the relationship between non-cognitive skills and years of schooling completed. The left three columns in the upper panel under each country category

provide the estimated results without adjusting for the years of schooling attained by the respondents' parents, and the following three columns are the results obtained after controlling for parental education level. Parents' completed years of schooling can serve as a proxy for the genetic inheritance of cognitive ability, socioeconomic status, and/or personality traits. Children of highly educated parents tend to become highly educated partly because of the intergenerational inheritance of unobserved abilities, which positively affect children's educational decisions. The overall results indicate that the statistical significance of personality traits does not change much even with the parental effect controlled for, although parental background mitigates the effects of the personality traits.

In both countries, among the different facets of personality traits, *openness to experiences* seem to have positive effect on the educational attainment in Japan and the US. However, country difference is found in *agreeableness*. More specifically, while *agreeableness* has positive effects in Japan, its effects are negative in the US. *Conscientiousness* and *emotional stability* are statistically significant only among American respondents. As indicated in the descriptive statistics in Table 1, *agreeableness* and *conscientiousness* have the highest mean values among five personality traits in Japan and the US, respectively. Even after controlling for socioeconomic variables, the effects of these traits are found to be statistically significant in educational attainment in the two countries. The results obtained from American respondents in our study are consistent with those reported by Goldberg et al. (1998), whose study was based on the representative sample of the US working adults aged 18 to 75. The authors found significant negative correlations between academic and career success and *agreeableness* and *extraversion*, as well as significant positive correlations with *conscientiousness* and *openness to experiences.*

The bottom panel of Table 2 indicates the effects personality traits on the probability of the transition to higher levels of education—college and graduate school. In Japan, there are no statistically significant personality effects on female students' decision to transition from high school to college. On the other hand, more agreeable and conscientious Japanese males are likely to go to college. In contrast, *introversion* and *openness to experiences* positively affect the decision of Japanese males to continue on to graduate level of education, whereas *extroversion* acts as a determinant for the decision of Japanese females to go to graduate school. The results suggest that, in Japan, the effects of personality traits vary at different educational transition points. Interestingly, *agreeableness*, which is the best predictor for the educational attainment below the college level, becomes negatively associated with the attainment of graduate level of education, although this effect is not statistically significant. In the US, there seems to be no significant difference in the effects of personality traits on the educational transition, when compared with the results obtained when the continuous variable of educational attainment (total years of schooling) is used. More specifically,

conscientiousness and *emotional stability* seem to play an important role in one's decision to pursue higher levels of education, as well as in the final educational attainment.

The Figure 2 displays standardized regression coefficients of personality traits associated with years of schooling, after controlling for the basic demographics—age, age squared, and gender. Two rectangular bars indicate the estimates of standardized regression coefficients and the line bars represent robust standard errors, with the darker rectangular bars representing the estimates obtained after controlling for the parental background. A one standard deviation increase in *agreeableness* and *conscientiousness* is associated with a 0.053 and 0.109 standard deviation increase in total years of schooling completed in Japan and the US, respectively, when parents' educational attainment controlled for, which is approximately equivalent to the increase in schooling by 0.1 and 0.26 years in Japan and the US. Moreover, *openness to experiences* and *emotional stability* are positively correlated with the educational attainment, whereby one standard deviation increase in these traits is associated with a 0.038 and 0.104 standard deviation increase in final educational attainment in Japan and the US, respectively. In comparison to the effects of personality traits, the effect of parental educational background is remarkably substantial in both countries, highlighting the importance of parental socioeconomic status and the generic inheritance of cognitive and non-cognitive skills. The inclusion of the parental background decreases the size of standardized regression coefficients of personality traits by approximately 0.01. However, they are still significantly correlated with the educational attainment even after controlling for the parental background.

4.3 Earnings and Career promotion

In this section, the relationship between earnings, as measured by the natural logarithm of one's own annual income, and personality factors is investigated (the findings are presented in Table 3). In both countries, *extraversion*, *conscientiousness*, and *emotional stability* seem to have significant effects on earnings, whereby *conscientiousness* is positively associated with earnings in particular among males and *extraversion* and *emotional stability* seem to more consistently correlate with earnings among females. These findings suggest that conscientious men and extraverted, emotionally stable women are more likely to succeed in the labor market in both countries. The country difference is only observed in *agreeableness*, which has a positive effect on the earning potential of Japanese males, but is negatively correlated with the earnings in the US. Thus, *agreeableness* appears to be a country-specific factor, affecting one's educational and career success in the opposite direction in Japan and the US.

Using the same log earnings equation, Figure 3-1 and 3-2 indicate the effects of non-cognitive ability on labor market success, expressed in standard deviation units of the distribution of earnings. The rectangular bars represent standardized regression coefficients that explain the variation of annual income based on distribution. This is compared with the coefficients in Table 3, which are calculated

based on the level of earnings relative to mean incomes. As can be seen, a one standard deviation increase in years of schooling is associated with a 0.09 and 0.21 standard deviation (about 4.5 percent and 7.4 percent) increase in the earnings of the Japanese and the US sample, respectively. Personality traits, which act as significant determinants for earnings, produced similar effect sizes (approximately 4 percent in Japan and 8 percent in the US). This trend was also consistently found in previous studies that are summarized by Bowles et al. (2001; Table 1), which indicate that one standard deviation in either cognitive ability or years of schooling is associated with 0.058 to 0.165 standard deviation increase in wages.

The darker rectangular bars in Figure 3-1 and 3-2 represent the estimates calculated after controlling for one's own years of schooling. The fact that most of the darker bars across two countries become shorter once educational attainment is controlled for indicates that this factor mitigates the impact of personality traits on earnings. Some of personality traits have the potential to affect earnings through the educational attainment. Even after controlling for years of schooling and work experience, as well as basic demographics, personality traits still have a significant explanatory power. It suggests that given the same educational and labor market background, they act as important determinants for successful labor market outcomes.

In order to assess the non-linear effects of personality on earnings, the regressions by income level were conducted (Table 4). The results indicate that *agreeableness*, which was found to be a particularly important factor affecting Japanese males' schooling (transition to college) and earnings, may only affect low-income males (10% quantile). *Extraversion* is also found to be statistically significant for low and high-income earners of Japanese males. In contrast, the analysis of the female labor force revealed that all significant personality traits seem to be more important for high-income earners. These findings suggest that the effects of traits on labor market outcomes may not be monotonic. In the case of the US, the statistically significant effects of *agreeableness* and *conscientiousness* are more observed at low-to-middle quantiles in particular among males. According to Almlund et al. (2011), the effect of personality traits may be more pronounced in those at the lower income level in the US, which is in line with our findings.

To investigate the key personality traits affecting the probability of being promoted to the management position in both countries, the probit regressions with two dependent values—which equal one if a respondent is promoted to management position, and is in management / executive / board member position at the time of conducting the survey—are conducted. These results are reported in Table 5, and the survey questions are presented in Section 3.4. It should be noted that the question used for the analysis of "promoted to management position" in the US survey may not be directly related to career "promotion". Overall, the results indicate that, for men, *extraversion* is a significant personality trait affecting career promotion in both countries. On the other hand, *openness to experiences* is significantly associated with female career promotion in the US. No

particular personality and behavioral characteristics are found among the surveyed Japanese female managers, possibly due to their low representation in management positions at only 2% (Table 1). When the degree of difficulty associated with being promoted was analyzed in relation to the company size, the male samples were further restricted by the size of company that they worked for at the time of the survey. The findings indicate that *extraversion* plays a more significant role in affecting career promotion in a bigger sized company.

In sum, *conscientiousness* plays a significant role in explaining the variation in male earnings, as proven by many previous studies, whereas *extraversion* and *emotional stability* seem to more consistently correlate with earnings among females. In addition, for males, *extraversion* best predicts the probability of being promoted to a management position. Finally, the main personality traits required for the success in the labor market, measured by the natural logarithm of annual income and career promotion to a management position, differ by gender, rather than by country.

4.4 Behavioral Characteristics

Extant evidence suggests that individual preferences, such as time discounting and risk aversion, as well as personality-related traits, are important determinants of life outcomes. Table 6 indicates that irrespective of inclusion of personality traits, behavioral characteristics appear to have strong influence on the level of educational attainment in both Japan and the US. Figure 4 also indicates that, when combining behavioral characteristics with personality traits, their explanatory power increases and is similar to that of years of schooling for economic success. It should be noted, however, that the explanatory powers for educational attainment and personality/behavioral traits cannot be simply compared by adjusted R-squared because of the possibility of correlations between personality traits and the educational attainment.

First, the preferences for egalitarian choices that reduce unequal payoffs affect educational attainment negatively and significantly. Being confident, but not overly overconfident, is a characteristic that seems to be a significant predictor for individual's educational success. In addition, more risk tolerant and patient individuals tend to have a higher educational achievement. The effect sizes of behavioral characteristics do not substantially change when personality-related traits and parental education are included into the model. First, a statistically significant negative relationship between educational attainment and the level of egalitarianism suggests that individuals that prefer payoffs being either favorable or unfavorable to their interests tend to have a higher educational attainment. In previous studies, authors reported that egalitarian individuals tend to avoid competitive environments (Bartling et al., 2009). This may suggest that less egalitarian people, who are more likely to self-select competitive situations, pursue higher education. This negative relationship between egalitarianism and educational attainment is observed in this study and applies to both countries. Next, more confident, but less overconfident, individuals tend to achieve a higher

educational attainment. As the overconfidence variable used in the present analyses is constructed by taking differences between one's own confidence level and the actual knowledge level, lower levels of overconfidence can be associated with precise self-evaluations, as well as the features specific to overconfidence.

More risk tolerant people seem to have a higher educational attainment. This negative relationship between risk aversion and educational outcomes is consistent with the findings of some previous studies that examined the correlations between the degree of risk aversion and cognitive ability. For example, Dohmen, Falk, Huffman, and Sunde (2010) reported positive relationship between risk tolerance and IQ. Burks, Carpenter, Goette, and Rustichini (2009) have found that individuals with higher IQ are consistent in their choices regarding risk tolerance, which suggests that more intelligent people can decide on their preferences better than their counterparts can. Moreover, the negative relationship between impatience (high time discount rate) and educational outcomes has been reviewed by some studies (Dohmen et al., 2010). Daly, Delaney, and Harmon (2009) found that lower discount rates were associated with cognitive mindfulness. These findings can be interpreted as an indication that impatient individuals assign greater significance to the present than to future periods, and thus may not appreciate the later rewards yielded by higher educational attainment.

Some of behavioral characteristics may capture the effect of personality traits. Daly et al. (2009) have found that *conscientiousness*—a trait related to self-control or elaboration of consequences—is negatively associated with the discount rate, which implies that conscientious people are likely to place higher significance on the consideration of future consequences. Moreover, according to Borghans, Golsteyn, Heckman, & Meijers (2009), risk aversion is likely related to *emotional stability*. These possible correlations between behavioral and personality traits may explain why *conscientiousness* and *emotional stability* lose statistical significance in explaining educational attainment in the US, when behavioral characteristics are included into the equation.

With respect to the effects on labor market outcomes, patience seems to have an explanatory power among males in both Japan and the US, while competitive attitude is important for higher earnings in Japan only. Behavioral variables do not seem to explain much of the variation in female annual incomes in either of the two analyzed countries. This may be due to the fact that the variation in earnings may be substantially explained by the personality traits which are correlated with behavioral characteristics, or just because behavioral characteristics do not explain much of the variation in female career success.

4.5 Robustness Check

In the present study, schooling and personxality are measured in the same year; thus, for older individuals, personality is measured long after education has been completed. This may complicate the interpretation of the correlations between schooling and personality traits, in particular for older

respondents. Moreover, as there may be some differences between generations, the sample used for data analysis was restricted by median age of each country. The results are summarized in Table 7. The first column corresponds to the base model, and the following two columns present results obtained when the sample was restricted to those whose age was higher and lower than the mean, respectively. Although some personal traits are significant only in either old or young cohort, no significant changes in the directions of each variable are noted, and the effects of the main personality traits—*agreeableness* and *conscientiousness* for male education, and *conscientiousness* for male earnings—do not differ by age group. These findings suggest that some particular personality traits have acted as significant predictors of educational attainment and career success over time in both Japan and the US. In contrast, some personality traits may indicate that significant determinants for success in school and labor market may differ between generations. For example, in the bottom panel of Table 7, *agreeableness* and *extraversion* are not significant for younger male workers in Japan, and *emotional stability* has been evaluated differently between generations in Japan and across males of different ages in the US.

For the robustness check for the measurement errors stemming from the limitations of the self-report questionnaire, different indicators of several behavioral characteristics are used. In the Japanese survey, there is a unique question that enables measuring the time discounting at young age. Specifically, the respondents were asked to indicate when they finished their homework during the summer vacation, with the responses ranging from "at the beginning" (1) to "at the end" (5). In addition, the time discount rate is calculated from the responses to the following scenario: "Let's assume that you were required to spend time cleaning a park. You need to spend two hours this Sunday, as well as next Sunday. It seems that the amount of litter in the park will be lower than expected, and you will need to spend less on cleaning the park. To account for this change, you have the option of shortening the cleaning time by one hour this Sunday, or decreasing the time you spend on cleaning next Sunday" (see Appendix 1 for more details). To find the point where the respondents feel indifferent between these two options over two different time periods, the discount rate is calculated. To compare the results, the level of confidence in finance questions was used as a measure of (over) confidence, while five levels of educational attainment (1~5) were used as a measure of schooling. The findings of these additional validity checks indicate that the overall results are stable across all the alternative variables.

5. Discussion

The estimated results presented here suggest that personality traits are significantly correlated with schooling, earnings, and career promotion. Previous studies using data collected in different countries yielded different results, possibly because the authors controlled for different covariates, or because some significant country differences exist. In the present study, the relationship between

personality traits and various outcomes is evaluated using the same covariates. Overall, our results indicate that there are substantial similarities in the effects of personality traits on both educational and labor market outcomes across countries, although a few contradictory results are found between Japan and the US.

Country Similarities and Gender Differences

In Japan and the US, *openness to experiences* and *emotional stability* are respectively correlated with educational attainment, although there has been no consensus on their relative importance. These two personality traits have been reported in previous literature sources to be predictors of educational outcomes. Implications of the effects of *openness to experiences* and *emotional stability* can be explained by their relation to the degree of intelligence, interest in learning, and self-control, which play an important role in cognitive ability and adolescent schooling decisions (for details, see Section 2). In addition, the effects of personality traits on labor market outcomes are very similar between the two analyzed countries. In both Japan and the US, males with high degree of *conscientiousness* seem to earn more, which is consistent with the general findings reported in extant studies on personality traits and career success. For women, *emotional stability* and *extraversion* seem to act as more important factors in determining their wages. The effects of both personality traits are positive and consistent across countries. With respect to career promotion, *extraversion* best predicts the probability of being promoted to a management position among males in both countries. These results are very consistent with the previous studies. The study of personality traits is advancing, and there is no agreed and established empirical consensus. Nonetheless, the effects of personality traits, which have been most commonly found in extant research to be significant for educational and labor market outcomes, are found to be similar across the two analyzed countries in this study.

Gender differentiation across cultures has been examined in some cross-cultural studies, which explain the gender difference based on the comparative significance of biological and cultural factors (Costa et al., 2001). If gender differences across countries follow similar patterns, this would suggest that biological factors play a greater role in the development of personality traits than do cultural factors. However, if the cultural factors are more relevant to gender differentiations, the relative importance of personality traits for each gender would be different and country-dependent (e.g., masculine versus feminine societies). Findings of many cross-cultural studies suggest that the gender differences are small across countries (Lynn & Martin, 1997). However, variations in the magnitudes of the gender differences have been noted. Williams and Best (1990) found that the gender differences were more pronounced in more developed countries with more individualistic value systems. Similarly, Costa et al. (2001) reported that the gender difference in personality traits was more evident in European and American cultures, even though traditional gender roles were least

emphasized in these countries. Our findings indicate that the personality traits that play an important role in succeeding in labor market are similar across the two analyzed countries. In other words, although the US and Japan have different norms for gender roles and social equality between men and women, the personality traits beneficial to the career success for each gender are similar across countries.

Country-specific Characteristics

In contrast to the similarities explained above, there is a distinct difference between these two countries and is most notable in the effects of *agreeableness.* *Agreeableness* is a personality trait in which Japanese people score noticeably higher than the others, and it is a particularly important predictor for schooling and earnings in Japan. However, it acts in the opposite direction in the US. Although *agreeableness* has been reported as less important predicator of the educational attainment in a substantial body of literature, it seems to be an important trait for higher educational achievement and career success in Japan. This may suggest that some country-specific determinants of success exist. Woessmann, Luedemann, Schuetz, and West (2009) have argued that personality traits of students may be determined by the characteristics of their educational environment, such as autonomy and degree of accountability. Rockoff, Jacob, Kane, and Staiger (2008) emphasized the importance of the teacher's influence on the development of students' non-cognitive skills. If this holds true, the characteristics of teaching style and school's educational philosophy may contribute to the unique variance in personality traits affecting the educational outcomes in Japan.

However, it should be borne in mind that this personality trait plays an important role in affecting the male earnings although it only affects low-income earners. This finding suggests that the benefits of *agreeableness*—which leads students to work well with classmates and teachers at school, and with colleagues at workplace—may not be equally relevant across different income levels. If *agreeableness* is not as significant as *conscientiousness* and *extraversion* for the career success among middle-to-high earners and/or job promotion, it can be said that school's educational philosophy and teaching style adopted by Japanese schools may have to consider education and training focused on the development of *conscientiousness* and *extraversion*, in addition to fostering *agreeableness* and the cognitive ability (e.g., test score or school grades).

Dee and West (2008) and Heckman et al. (2010) have proved the importance of fostering students' non-cognitive skills through school programs and governmental policies. Findings of both studies indicate that non-cognitive skills have greater long-term effects on life outcomes than do cognitive skills. Chetty et al. (2010) reported persistent impacts of the Project STAR—a Tennessee class size reduction demonstration project—on later outcomes through the development of the students' non-cognitive skills, which is in contrast to the fade-out effect of class quality on test scores after the completion of this project. This suggests that formulating and financing a school program or

government policy aimed at the early intervention designed to foster the non-cognitive skills is as important as, or even more important, in helping children achieve their educational potential. This is particularly relevant to those raised in lower income families, as such initiatives help avoid another vicious cycle of intergenerational inequality.

6. Conclusion

Much attention has been paid to the predictive power of measures of intelligence when evaluating cumulative human capital. However, it has been arguably discussed that no single measure of cognitive ability predicts much of the variance in educational and labor market outcomes. Since most of the remaining variance is not explained by measurement error, it leaves much room for other determinants of success. This study considered soft skills and behavioral characteristics as possible predictors of the unexplained variance in educational and labor market outcomes. Soft skills are measured by Big 5 personality traits, which is now widely accepted taxonomy in the study of personality traits. Behavioral characteristics are indicated by egalitarianism, (over) confidence, time preference, and risk aversion.

A comparative analysis was conducted using the Japanese and US survey data collected using the same survey methods to examine whether non-cognitive skills and behavioral characteristics explain the variation in schooling and labor market outcomes. The results reported here suggest that different facets of Big 5 personality traits are associated with academic and occupational success. More specifically, *openness to experiences* is positively correlated with educational attainment, while *extraversion* and *conscientiousness* are positively correlated with labor market outcomes in both countries. Overall, the effects of personality traits work in a very similar way in Japan and the US. However, a significant difference between two countries is observed in the effect of personality, with respect to *agreeableness* and *conscientiousness.* In particular, *agreeableness* seems to have a positive effect on educational attainment in Japan, whereas it is negatively correlated with educational attainment in the US, where *conscientiousness and emotional stability* play a more significant role in the decision to attain higher levels of education. Given that *conscientiousness* was found to be the best predictor of educational and labor market outcomes in many previous studies, the fact that *agreeableness,* rather than *conscientiousness,* is found to be a significant indicator in Japan may suggest that traits relevant for academic and career success are country-specific, partly because of the difference in teaching and educational system.

With respect to labor market outcomes, the study findings indicate the presence of some gender differences. In both Japan and the US, *conscientiousness* seems to contribute to male earnings, which is consistent with the general finding of studies on personality traits, whereas *extraversion* and *emotional stability* are more important predictors of female earnings. For the career promotion, *extraversion* is an important determinant for the probability of being promoted to a management

position among males in both countries. As discussed, some personality traits are associated with educational and career success to different degrees between genders, rather than countries.

However, there are some limitations that restrict the generalizability of the present findings and the ability to conclude that the results presented here suggest causal relationship. Although some extant studies prove the stability of personality traits at working age, and suggest that the personality traits are stable even when examined under the fluctuation of economic events, further studies are needed to investigate the possibility of change in personality by a long-term training in a certain occupation or some unexpected life events. If the stability of personality traits is not guaranteed, it is difficult to conclude whether a personality trait affects labor outcomes or vice versa, or whether they mutually influence each other.

Continuing to study personality traits is significant for several reasons. First, it is known that personality traits are more responsive to education and training at an early age, and thus, increasing the understanding of their effects has an important place in effective public policies targeted at the development of soft skills. Moreover, personality traits predict educational performance and wages across a broad range of occupational categories. Thus, compared to cognitive ability that may play a more important role in determining job performance of certain occupations (e.g., medical doctor or professor), the Big 5 personality traits can act as a determinant for the success in various types of occupations. To examine the effects of non-cognitive skills more thoroughly, further studies should focus on evaluating the policies concerning the development of children's soft skills and should aim to determine how personality traits differ by occupational categories.

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Table 1. Descriptive Statistics

	Japan						US					
	Whole Sample		Males		Females		Whole Sample		Males		Females	
Dependent variables	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Years of schooling	13.39	2.00	13.71	2.27	13.13	1.71	14.43	2.42	14.57	2.61	14.32	2.24
College (=1)	0.27	0.44	0.40	0.49	0.16	0.37	0.39	0.49	0.42	0.49	0.36	0.48
Graduate school (=1)	0.02	0.13	0.03	0.17	0.01	0.09	0.13	0.34	0.15	0.36	0.12	0.32
Annual Income (log)	5.63	0.91	6.09	0.66	5.07	0.86	5.95	0.86	6.14	0.81	5.75	0.87
Promoted to management position	0.12	0.33	0.21	0.41	0.02	0.12	0.15	0.36	0.18	0.38	0.13	0.34
Management/ Executives	0.05	0.21	0.07	0.25	0.02	0.14	0.12	0.33	0.16	0.36	0.09	0.29
Big 5 Personality												
Extraversion	4.09	1.29	3.96	1.29	4.20	1.28	3.96	1.45	3.91	1.47	4.00	1.44
Agreeableness	4.99	0.93	4.92	0.95	5.04	0.91	5.06	1.22	4.79	1.24	5.28	1.16
Conscientiousness	3.99	1.06	4.00	1.05	3.97	1.07	5.75	1.15	5.61	1.14	5.87	1.14
Emotional_stability	4.01	1.03	4.11	1.01	3.92	1.04	4.84	1.35	4.90	1.37	4.79	1.33
Openness_to_experiences	3.89	1.07	4.03	1.04	3.78	1.07	4.69	1.16	4.70	1.14	4.67	1.19
Behaviroal Variables												
Egalitarian (=1)	0.57	0.49	0.51	0.50	0.62	0.48	0.67	0.47	0.62	0.49	0.72	0.45
Confidence	0.37	0.48	0.51	0.50	0.26	0.44	0.58	0.49	0.72	0.45	0.46	0.50
Overconfidence	0.27	0.44	0.34	0.47	0.22	0.41	0.24	0.43	0.24	0.43	0.25	0.43
Risk aversion	3.37	0.88	3.31	0.93	3.41	0.84	3.52	0.80	3.44	0.86	3.59	0.74
Impatience (money question)	0.08	0.11	0.09	0.11	0.07	0.11	0.07	0.10	0.08	0.11	0.07	0.10
Impatience (park question)	0.50	0.41	0.51	0.39	0.48	0.42	0.47	0.33	0.47	0.32	0.46	0.33
Impatience (homework question)	3.28	1.34	3.52	1.31	3.09	1.33						
Socio-economic variables												
Age	50.34	9.57	50.85	9.36	49.92	9.73	49.75	9.46	49.68	9.47	49.81	9.46
Age squared	2625.5	947.4	2673.1	930.7	2586.2	959.5	2564.6	916.2	2557.2	916.2	2570.7	916.6
Female	0.55	0.50	0.00	0.00	1.00	0.00	0.54	0.50	0.00	0.00	1.00	0.00
Parental Education	11.07	1.92	10.95	1.96	11.18	1.89	12.51	2.13	12.60	2.17	12.43	2.09
Earnings equation												
Years of potential experience	29.47	9.61	29.79	9.57	29.08	9.65	28.34	9.63	28.01	9.19	28.69	10.08
Years of potential experience (squared)	960.98	570.37	979.09	568.78	938.61	571.85	895.98	529.13	868.73	501.72	924.38	555.52
(Occupation)												
Office and administrative support	0.22	0.41	0.14	0.34	0.31	0.46	0.14	0.35	0.03	0.17	0.25	0.43
Sales and related occupations	0.11	0.31	0.09	0.28	0.14	0.35	0.12	0.32	0.11	0.31	0.13	0.34
Management, business, and financial operations	0.12	0.33	0.21	0.41	0.02	0.12	0.15	0.36	0.18	0.38	0.13	0.34
Professional and related occupations	0.21	0.41	0.21	0.41	0.21	0.41	0.29	0.45	0.29	0.45	0.29	0.46
Service occupations	0.19	0.39	0.16	0.36	0.23	0.42	0.19	0.39	0.19	0.40	0.18	0.38
Construction, extraction, and maintenance	0.14	0.34	0.18	0.39	0.08	0.27	0.10	0.30	0.19	0.39	0.01	0.09
Farming, fishing, and forestry	0.02	0.13	0.02	0.14	0.02	0.13	0.01	0.12	0.02	0.13	0.01	0.10
(Employment Type)												
Employee of private company or organization	0.69	0.46	0.67	0.47	0.72	0.45	0.60	0.49	0.56	0.50	0.63	0.48
Government employee	0.10	0.30	0.11	0.31	0.09	0.29	0.18	0.38	0.17	0.37	0.19	0.39
Management position	0.05	0.21	0.07	0.25	0.02	0.14	0.12	0.33	0.16	0.36	0.09	0.29
Self-employed	0.10	0.31	0.12	0.33	0.08	0.27	0.09	0.28	0.10	0.31	0.07	0.25
Family business employee (in self-employed business)	0.05	0.22	0.02	0.15	0.09	0.28	0.01	0.11	0.01	0.09	0.02	0.14
(Industry)												
Agriculture and related industries	0.02	0.15	0.03	0.16	0.02	0.14	0.02	0.13	0.02	0.15	0.01	0.11
Mining	0.00	0.04	0.00	0.05	0.00	0.00	0.00	0.06	0.01	0.09	0.00	0.00
Construction	0.08	0.27	0.10	0.30	0.05	0.21	0.07	0.25	0.11	0.31	0.02	0.14
Manufacturing	0.16	0.37	0.22	0.42	0.09	0.29	0.11	0.31	0.16	0.36	0.05	0.22
Wholesale trade/Retail trade	0.12	0.32	0.11	0.31	0.13	0.34	0.11	0.31	0.11	0.31	0.10	0.30
Finance and insurance	0.04	0.19	0.04	0.18	0.04	0.20	0.08	0.27	0.06	0.24	0.10	0.30
Real estate	0.01	0.10	0.01	0.09	0.01	0.10	0.01	0.11	0.01	0.10	0.02	0.13
Transportation/Telecommunications	0.06	0.23	0.08	0.28	0.03	0.16	0.05	0.23	0.06	0.24	0.05	0.22
Utilities	0.02	0.14	0.02	0.15	0.02	0.13	0.02	0.14	0.03	0.16	0.01	0.11
Professional and business services	0.25	0.43	0.20	0.40	0.32	0.47	0.27	0.44	0.21	0.41	0.33	0.47
Others	0.08	0.27	0.06	0.24	0.10	0.30	0.26	0.44	0.23	0.42	0.30	0.46
(Employment)												
Years of work experience at the current workplace	23.97	3.98	24.32	3.30	23.55	4.65	13.07	9.74	13.40	10.14	12.73	9.31
Size of company	306.8	498.4	407.1	581.6	182.8	331.5	1543.6	1979.2	1482.2	1968.9	1607.5	1990.4

Note: Big 5 Personality traits, behavioral variables and socio-economic variables are described with the samples used for the analysis for educational attainment (Japan = 3,199 ; US =1,574) and variables under the title of "Earnings equation" are summarized with the sample used for the analysis for the determinants of the annual income (Japan = 1,994 ; US =770).

Table2. Determinants for Educational Attainment in Japan and the US

Dependent variable: Total years of schooling	**Japan**			**Japan**			**US**			**US**		
	Without family socioeconomic var.			With family socioeconomic var.			Without family socioeconomic var.			With family socioeconomic var.		
Regression Model: OLS	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female
Big 5 Personality												
Extraversion	-0.0037	-0.0280	0.0111	-0.0436	-0.0555	-0.0364	-0.0315	-0.0888	0.0224	-0.0750*	-0.0998	-0.0528
	(0.029)	(0.051)	(0.033)	(0.028)	(0.049)	(0.032)	(0.043)	(0.069)	(0.054)	(0.042)	(0.067)	(0.052)
Agreeableness	0.1512***	0.2033***	0.0955**	0.1150***	0.1982***	0.0368	-0.1149**	-0.0924	-0.1121	-0.1382**	-0.1017	-0.1537**
	(0.039)	(0.066)	(0.044)	(0.037)	(0.062)	(0.042)	(0.056)	(0.083)	(0.073)	(0.054)	(0.082)	(0.068)
Conscientiousness	0.0283	0.0852	-0.0125	0.0367	0.0865	-0.0014	0.2483***	0.2721***	0.2040***	0.2312***	0.2381***	0.2078***
	(0.035)	(0.062)	(0.040)	(0.033)	(0.059)	(0.037)	(0.057)	(0.089)	(0.075)	(0.054)	(0.086)	(0.069)
Emotional_stability	0.0550	0.0927	0.0255	0.0196	0.0470	-0.0018	0.2028***	0.2655***	0.1456**	0.1879***	0.2585***	0.1268**
	(0.036)	(0.064)	(0.041)	(0.035)	(0.062)	(0.039)	(0.050)	(0.078)	(0.065)	(0.048)	(0.075)	(0.061)
Openness_to_experiences	0.0940***	0.1132*	0.0753*	0.0727**	0.0629	0.0717*	0.0907*	0.1060	0.0765	0.0852*	0.0844	0.0888
	(0.035)	(0.063)	(0.039)	(0.034)	(0.061)	(0.037)	(0.053)	(0.087)	(0.065)	(0.050)	(0.084)	(0.060)
Total years of schooling				0.4038***	0.4510***	0.3668***				0.4152***	0.3970***	0.4269***
of parents				(0.017)	(0.028)	(0.020)				(0.028)	(0.045)	(0.033)
Observations	3,366	1,522	1,844	3,199	1,445	1,754	1,638	754	884	1,574	717	857
R-squared	0.055	0.030	0.054	0.186	0.162	0.194	0.040	0.048	0.047	0.166	0.155	0.189

Dependent variable: Probability of entering college / graduate	**Japan**			**Japan**			**US**			**US**		
	College (=1)			**Graduate School (=1)**			**College (=1)**			**Graduate School (=1)**		
Regression Model: Probit	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female
Big 5 Personality												
Extraversion	-0.0207	-0.0202	-0.0286	-0.0295	-0.1451**	0.2425**	-0.0379	-0.0430	-0.0385	-0.0037	0.0099	-0.0183
	(0.022)	(0.030)	(0.033)	(0.048)	(0.060)	(0.097)	(0.024)	(0.035)	(0.034)	(0.029)	(0.041)	(0.042)
Agreeableness	0.0660**	0.1132***	-0.0084	-0.0235	-0.0062	-0.1190	-0.0954***	-0.0537	-0.1320***	-0.0167	-0.0345	0.0099
	(0.030)	(0.040)	(0.046)	(0.066)	(0.079)	(0.123)	(0.032)	(0.045)	(0.048)	(0.040)	(0.054)	(0.059)
Conscientiousness	0.0644**	0.0955***	0.0336	0.0225	0.0579	-0.0192	0.1513***	0.1695***	0.1347***	0.1294***	0.1130*	0.1307**
	(0.026)	(0.036)	(0.039)	(0.058)	(0.071)	(0.105)	(0.033)	(0.049)	(0.045)	(0.042)	(0.061)	(0.060)
Emotional_stability	0.0256	0.0443	0.0107	0.0787	0.0909	0.0871	0.0968***	0.1219***	0.0729*	0.0505	0.1242**	-0.0230
	(0.027)	(0.039)	(0.039)	(0.060)	(0.074)	(0.107)	(0.029)	(0.042)	(0.042)	(0.036)	(0.052)	(0.052)
Openness_to_experiences	0.0043	-0.0021	0.0038	0.0955*	0.1595**	-0.0363	0.0153	-0.0161	0.0462	0.0445	0.0497	0.0464
	(0.026)	(0.037)	(0.038)	(0.057)	(0.070)	(0.101)	(0.032)	(0.047)	(0.044)	(0.039)	(0.057)	(0.055)
Total years of schooling	0.2582***	0.2553***	0.2757***	0.1332***	0.1332***	0.1556***	0.2219***	0.1811***	0.2650***	0.1387***	0.1316***	0.1492***
of parents	(0.014)	(0.020)	(0.021)	(0.028)	(0.034)	(0.054)	(0.018)	(0.024)	(0.026)	(0.019)	(0.027)	(0.028)
Observations	3,202	1,442	1,760	3,199	1,445	1,754	1,574	717	857	1,574	717	857

Note: Both estimations are controlled by socioeconomic variables (age, age squared). Family socioeconomic variable means the educational level of parents

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3. Determinants for Earnings in Japan and the US

Dependent variable: Log (annual earnings)	Japan			Japan			US			US		
	Without one's own education			With one's own education			Without one's own education			With one's own education		
Regression Model: OLS	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female
Big 5 Personality												
Extraversion	0.0362***	0.0336**	0.0372*	0.0379***	0.0348***	0.0389*	0.0275	0.0059	0.0532*	0.0270	0.0048	0.0521*
	(0.012)	(0.014)	(0.021)	(0.012)	(0.013)	(0.021)	(0.018)	(0.025)	(0.028)	(0.018)	(0.024)	(0.028)
Agreeableness	0.0132	0.0431**	-0.0362	0.0093	0.0368**	-0.0359	-0.0838***	-0.0772**	-0.0854**	-0.0852***	-0.0789**	-0.0887**
	(0.016)	(0.018)	(0.029)	(0.016)	(0.018)	(0.029)	(0.024)	(0.034)	(0.036)	(0.023)	(0.032)	(0.035)
Conscientiousness	0.0366**	0.0524***	0.0308	0.0345**	0.0471***	0.0310	0.0892***	0.1188***	0.0496	0.0784***	0.1089***	0.0393
	(0.015)	(0.016)	(0.025)	(0.015)	(0.016)	(0.024)	(0.026)	(0.035)	(0.043)	(0.026)	(0.035)	(0.042)
Emotional_stability	0.0117	-0.0219	0.0499*	0.0087	-0.0246	0.0481*	0.0687***	0.0413	0.0987***	0.0609***	0.0323	0.0922***
	(0.015)	(0.017)	(0.026)	(0.015)	(0.016)	(0.026)	(0.023)	(0.032)	(0.035)	(0.023)	(0.031)	(0.034)
Openness_to_experiences	0.0238	0.0092	0.0282	0.0201	0.0088	0.0234	0.0109	0.0208	-0.0005	0.0052	0.0145	-0.0053
	(0.015)	(0.017)	(0.026)	(0.015)	(0.017)	(0.026)	(0.022)	(0.031)	(0.034)	(0.022)	(0.031)	(0.033)
Total years of schooling				0.0443***	0.0418***	0.0401**				0.0737***	0.0619***	0.0949***
				(0.009)	(0.009)	(0.018)				(0.012)	(0.015)	(0.020)
Observations	1,994	1,102	892	1,994	1,102	892	770	393	377	770	393	377
R-squared	0.468	0.309	0.248	0.475	0.323	0.253	0.407	0.408	0.384	0.435	0.434	0.423

Note: Both estimations are controlled by socioeconomic variables (years of potential experience and its squared, occupation, type of employment, company size, and years of employment at the current work place). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 4. Determinants for Earnings in Japan and the US by income level

Dependent variable: Log (annual earnings)										
Quantile Regression	Male					Female				
Japan	10%	25%	50%	75%	90%	10%	25%	50%	75%	90%
Extraversion	0.0322	0.0322**	0.0190	0.0154	0.0065	0.0000	0.0098	0.0296	0.0393	0.0126
	(0.036)	(0.016)	(0.015)	(0.013)	(0.017)	(0.000)	(0.032)	(0.024)	(0.028)	(0.022)
Agreeableness	0.1661***	0.0277	0.0137	-0.0028	-0.0061	0.0000	0.0020	-0.0309	-0.0421	-0.0313
	(0.048)	(0.022)	(0.021)	(0.017)	(0.022)	(0.000)	(0.033)	(0.036)	(0.034)	(0.033)
Conscientiousness	0.1074***	0.0328	0.0284	0.0365**	0.0434**	-0.0000	-0.0024	0.0199	0.0278	0.0503**
	(0.041)	(0.021)	(0.020)	(0.015)	(0.019)	(0.000)	(0.024)	(0.031)	(0.030)	(0.025)
Emotional_stability	-0.0666	-0.0260	0.0029	-0.0072	0.0075	-0.0000	0.0095	0.0324	0.0417	0.0554*
	(0.041)	(0.021)	(0.018)	(0.019)	(0.020)	(0.000)	(0.028)	(0.032)	(0.036)	(0.028)
Openness_to_experiences	0.0406	0.0238	0.0058	-0.0005	0.0049	-0.0000	0.0061	0.0240	0.0236	0.0070
	(0.039)	(0.020)	(0.017)	(0.017)	(0.023)	(0.000)	(0.035)	(0.036)	(0.031)	(0.027)
Total years of schooling	0.0352	0.0451***	0.0555***	0.0382***	0.0446***	0.0000	0.0002	0.0344*	0.0763***	0.0596***
	(0.026)	(0.012)	(0.011)	(0.010)	(0.010)	(0.000)	(0.019)	(0.020)	(0.022)	(0.018)
Observations	1,102	1,102	1,102	1,102	1,102	892	892	892	892	892
Quantile Regression	Male					Female				
US	10%	25%	50%	75%	90%	10%	25%	50%	75%	90%
Extraversion	-0.0638	-0.0201	0.0164	0.0097	0.0018	0.0796	0.0456	0.0553*	0.0266	0.0132
	(0.079)	(0.037)	(0.025)	(0.028)	(0.023)	(0.055)	(0.048)	(0.033)	(0.026)	(0.026)
Agreeableness	-0.0390	-0.0412	-0.0644**	-0.0421	0.0078	-0.1691**	-0.1463**	-0.0710*	-0.0606	-0.0663*
	(0.098)	(0.046)	(0.032)	(0.033)	(0.033)	(0.074)	(0.059)	(0.042)	(0.042)	(0.039)
Conscientiousness	-0.0031	0.1304**	0.1053**	0.0513	0.0520	0.0900	0.1159	0.0259	-0.0066	0.0182
	(0.083)	(0.052)	(0.042)	(0.040)	(0.033)	(0.070)	(0.076)	(0.053)	(0.044)	(0.036)
Emotional_stability	0.1972**	0.0397	0.0048	0.0106	-0.0162	0.1283**	0.1248**	0.0725*	0.0182	-0.0054
	(0.083)	(0.047)	(0.035)	(0.034)	(0.030)	(0.058)	(0.053)	(0.038)	(0.039)	(0.041)
Openness_to_experiences	-0.0301	0.0020	0.0400	0.0233	0.0497	-0.0423	-0.0431	0.0159	0.0766**	0.1080***
	(0.096)	(0.043)	(0.036)	(0.037)	(0.034)	(0.072)	(0.062)	(0.043)	(0.038)	(0.037)
Total years of schooling	0.1065***	0.0580***	0.0618***	0.0342*	0.0555***	0.1051***	0.0976***	0.0671**	0.0977***	0.0777***
	(0.039)	(0.022)	(0.017)	(0.019)	(0.020)	(0.038)	(0.033)	(0.026)	(0.023)	(0.021)
Observations	393	393	393	393	393	377	377	377	377	377

Note: Both estimations are controlled by socioeconomic variables (years of potential experience and its squared, occupation, type of employment, company size, and years of employment at the current work place). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. Determinants for Career Promotion in Japan and the US

	Dependent variable: Promoted to management position (=1)						**Dependent variable: Management/ Executives (=1)**					
	Japan			**US**			**Japan**			**US**		
Regression Model: OLS	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female
Big 5 Personality												
Extraversion	0.1056***	0.1112***	0.1120	0.0458	0.0224	0.0347	0.1574***	0.1881***	0.0893	0.0827**	0.0977*	0.0391
	(0.034)	(0.037)	(0.099)	(0.039)	(0.054)	(0.060)	(0.045)	(0.054)	(0.089)	(0.041)	(0.055)	(0.066)
Agreeableness	0.0765*	0.0627	0.1149	-0.0575	0.0032	-0.1528*	-0.0094	-0.0268	-0.0226	0.0059	0.0121	-0.0422
	(0.045)	(0.050)	(0.132)	(0.050)	(0.067)	(0.083)	(0.057)	(0.070)	(0.111)	(0.053)	(0.068)	(0.091)
Conscientiousness	0.0399	0.0355	0.0435	0.1079**	0.1016	0.1214	0.0370	0.0108	0.0707	0.0166	0.0113	0.0443
	(0.041)	(0.045)	(0.104)	(0.055)	(0.076)	(0.084)	(0.051)	(0.061)	(0.097)	(0.055)	(0.075)	(0.088)
Emotional_stability	0.0086	0.0282	-0.0827	0.0387	0.1183*	-0.0232	0.0806	0.0888	0.1001	-0.0310	0.0049	-0.0743
	(0.043)	(0.047)	(0.117)	(0.047)	(0.066)	(0.073)	(0.055)	(0.067)	(0.104)	(0.050)	(0.066)	(0.080)
Openness_to_experiences	-0.0063	-0.0261	0.0767	0.0256	-0.0105	0.0978	-0.0289	-0.0519	0.0283	0.0620	-0.0125	0.1848**
	(0.042)	(0.047)	(0.108)	(0.053)	(0.076)	(0.081)	(0.053)	(0.065)	(0.100)	(0.055)	(0.074)	(0.091)
Total years of schooling	0.1444***	0.1540***	0.0736	0.0133	0.0301	-0.0309	0.0776***	0.1039***	-0.0376	0.0514**	0.0462	0.0582
	(0.021)	(0.022)	(0.070)	(0.025)	(0.032)	(0.041)	(0.027)	(0.031)	(0.063)	(0.025)	(0.033)	(0.043)
Observations	2,358	1,237	912	902	453	444	2,259	1,225	978	940	464	450

Only Male workers	**Dependent variable: Promoted to management position (=1)**						**Dependent variable: Management/ Executives (=1)**					
	Japan	**By Company Size**		**US**	**By Company Size**		**Japan**	**By Company Size**		**US**	**By Company Size**	
Regression Model: OLS	Male	>=500	<500	Male	>=500	<500	Male	>=500	<500	Male	>=500	<500
Big 5 Personality												
Extraversion	0.1112***	0.2756***	0.0672	0.0224	0.0903	-0.0488	0.1881***	0.3127**	0.1739***	0.0977*	0.1613**	0.1112
	(0.037)	(0.086)	(0.043)	(0.054)	(0.067)	(0.084)	(0.054)	(0.128)	(0.061)	(0.055)	(0.080)	(0.079)
Agreeableness	0.0627	0.1372	0.0134	0.0032	-0.0209	0.0502	-0.0268	-0.1983	-0.0035	0.0121	0.0774	0.0050
	(0.050)	(0.117)	(0.056)	(0.067)	(0.088)	(0.103)	(0.070)	(0.167)	(0.079)	(0.068)	(0.105)	(0.098)
Conscientiousness	0.0355	0.1026	0.0323	0.1016	-0.0358	0.3230***	0.0108	0.2266	-0.0283	0.0113	-0.1339	0.0991
	(0.045)	(0.101)	(0.052)	(0.076)	(0.101)	(0.125)	(0.061)	(0.146)	(0.071)	(0.075)	(0.113)	(0.103)
Emotional_stability	0.0282	-0.0303	0.0530	0.1183*	0.0715	0.0864	0.0888	0.0999	0.0862	0.0049	-0.0114	0.0167
	(0.047)	(0.105)	(0.055)	(0.066)	(0.085)	(0.104)	(0.067)	(0.141)	(0.078)	(0.066)	(0.097)	(0.096)
Openness_to_experiences	-0.0261	-0.1081	-0.0060	-0.0105	0.0456	-0.0425	-0.0519	-0.2036	-0.0343	-0.0125	-0.1246	0.0094
	(0.047)	(0.101)	(0.054)	(0.076)	(0.105)	(0.104)	(0.065)	(0.143)	(0.075)	(0.074)	(0.116)	(0.097)
Total years of schooling	0.1540***	0.1645***	0.1456***	0.0301	-0.0101	0.0407	0.1039***	0.1930***	0.0760**	0.0462	0.0618	0.0367
	(0.022)	(0.049)	(0.025)	(0.032)	(0.042)	(0.049)	(0.031)	(0.072)	(0.036)	(0.033)	(0.046)	(0.046)
Observations	1,237	260	985	453	453	444	1,225	258	949	464	219	269

Note: There are two dependent variables used for the analyses of career promotion.The first dependent variable (Promoted to management position (=1)) is constructed from the questions: whether the respondent has been promoted to a manager, director or board member of a private company or governmental office in Japanese survey; "management, business, and finanacial operations" in the US survey. The second dependent variable (Management / Executives (=1)) is constructed from the questions: whether the respondent is a company executive or a board member in the Japanese survey and it is translated into "Management Position" in the US survey. It may hinder a direct comparison on each question between countries, but overall results suggest that "extraversion" seems to be a robust determinant for career promotion in both countries. Both estimations are controlled by socioeconomic variables (years of potential experience and its squared, company size, and years of work experience at the current work place, dummies of industry). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6. Effects of Behavioral Characteristics on Education and Earnings in Japan and the US

Dependent variable: Total years of schooling							Dependent variable: Log (annual earnings)					
	Japan			**US**			**Japan**			**US**		
Regression Model: OLS	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female	Whole	Male	Female
Behaviroal Variables												
Egalitarian (=1)	-0.1803**	-0.2931**	-0.0739	-0.4598***	-0.4209*	-0.4249*	-0.0604*	-0.0905**	-0.0402	0.0239	0.0326	-0.0481
	(0.075)	(0.125)	(0.088)	(0.167)	(0.246)	(0.223)	(0.033)	(0.036)	(0.059)	(0.062)	(0.082)	(0.104)
Confidence	-0.1228	-0.1528	-0.0788	0.5671***	0.6052**	0.3557	0.0118	0.0086	-0.0268	0.0818	0.0900	0.0304
	(0.136)	(0.172)	(0.234)	(0.185)	(0.275)	(0.254)	(0.049)	(0.048)	(0.160)	(0.071)	(0.092)	(0.116)
Overconfidence	-0.1509	-0.2272	-0.0763	-0.2499	-0.8752***	0.3605	-0.0266	-0.0357	0.0796	-0.0284	-0.0781	0.0389
	(0.140)	(0.174)	(0.241)	(0.216)	(0.310)	(0.309)	(0.051)	(0.052)	(0.164)	(0.076)	(0.089)	(0.141)
Risk aversion	-0.0820*	-0.0615	-0.1230**	-0.2453**	-0.3403**	-0.1236	0.0143	0.0111	0.0154	0.0043	-0.0506	0.0244
	(0.043)	(0.069)	(0.053)	(0.109)	(0.150)	(0.153)	(0.018)	(0.020)	(0.032)	(0.043)	(0.054)	(0.074)
Impatience	-0.9304***	-1.0138*	-0.7228*	-0.9438	-2.0229*	0.0401	-0.1008	-0.4041**	0.3871	-0.3176	-0.9241*	0.1827
	(0.336)	(0.550)	(0.401)	(0.711)	(1.068)	(0.952)	(0.154)	(0.166)	(0.267)	(0.349)	(0.521)	(0.468)
Big 5 Personality												
Extraversion	-0.0251	-0.0132	-0.0365	-0.0314	-0.1022	0.0100	0.0370***	0.0344**	0.0362	0.0242	0.0205	0.0276
	(0.031)	(0.056)	(0.035)	(0.055)	(0.085)	(0.072)	(0.014)	(0.015)	(0.024)	(0.021)	(0.028)	(0.036)
Agreeableness	0.1002**	0.2070***	-0.0036	-0.0733	-0.0435	-0.1007	0.0151	0.0184	0.0043	-0.1110***	-0.1232***	-0.1072**
	(0.042)	(0.069)	(0.048)	(0.072)	(0.105)	(0.093)	(0.017)	(0.018)	(0.031)	(0.025)	(0.032)	(0.042)
Conscientiousness	0.0539	0.1104*	0.0016	0.1989**	0.0877	0.2900***	0.0263*	0.0324*	0.0356	-0.0091	0.0122	-0.0460
	(0.038)	(0.066)	(0.042)	(0.078)	(0.121)	(0.097)	(0.016)	(0.017)	(0.027)	(0.031)	(0.042)	(0.050)
Emotional_stability	0.0042	0.0418	-0.0245	0.1771***	0.3299***	0.0471	0.0143	-0.0164	0.0463	0.0981***	0.0799**	0.1300***
	(0.039)	(0.069)	(0.044)	(0.068)	(0.099)	(0.090)	(0.017)	(0.018)	(0.029)	(0.027)	(0.034)	(0.046)
Openness_to_experiences	0.0682*	0.0452	0.0757*	0.0075	0.0252	0.0306	0.0224	0.0076	0.0404	0.0108	0.0264	-0.0179
	(0.038)	(0.069)	(0.041)	(0.065)	(0.101)	(0.084)	(0.017)	(0.018)	(0.028)	(0.028)	(0.039)	(0.044)
Socio-economic variables												
Total years of schooling	0.3911***	0.4288***	0.3624***	0.3774***	0.3282***	0.4163***	0.0466***	0.0426***	0.0489**	0.0711***	0.0476**	0.1084***
	(0.019)	(0.031)	(0.022)	(0.036)	(0.055)	(0.047)	(0.009)	(0.010)	(0.020)	(0.015)	(0.019)	(0.026)
Obs	2,583	1,178	1,405	953	463	490	1,654	922	732	484	251	233
R-squared	0.183	0.164	0.194	0.167	0.179	0.198	0.492	0.343	0.287	0.495	0.574	0.460

Note: Estimations for education attainment are controlled by socioeconomic variables (age, age squared) and estimations for annual earnings are controlled by socioeconomic variables (years of potential experience and its squared, occupation, type of employment, company size, and years of employment at the current work place).
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 7. Determinants for Educational Attainment and Annual Income in Japan and the US by Age Group

Dependent variable: Total years of schooling

Regression Model: OLS	**Japan** Male Base	(Male) Age>= Mean	Age< Mean	**Japan** Female Base	(Female) Age>= Mean	Age< Mean	**US** Male Base	(Male) Age>= Mean	Age< Mean	**US** Female Base	(Female) Age>= Mean	Age< Mean
Big 5 Personality												
Extraversion	-0.0555	-0.1047	0.0333	-0.0364	-0.0155	-0.0572	-0.0998	-0.1003	-0.0859	-0.0528	-0.1005	-0.0034
	(0.049)	(0.069)	(0.069)	(0.032)	(0.045)	(0.044)	(0.067)	(0.087)	(0.108)	(0.052)	(0.069)	(0.078)
Agreeableness	0.1982***	0.2542***	0.1405*	0.0368	0.0425	0.0257	-0.1017	-0.0411	-0.1725	-0.1537**	-0.0259	-0.2775***
	(0.062)	(0.091)	(0.084)	(0.042)	(0.057)	(0.061)	(0.082)	(0.125)	(0.106)	(0.068)	(0.095)	(0.094)
Conscientiousness	0.0865	0.0964	0.0607	-0.0014	-0.0717	0.0691	0.2381***	0.2244*	0.2569**	0.2078***	0.0986	0.3389***
	(0.059)	(0.083)	(0.086)	(0.037)	(0.052)	(0.053)	(0.086)	(0.127)	(0.114)	(0.069)	(0.098)	(0.091)
Emotional_stability	0.0470	0.0474	0.0639	-0.0018	0.0662	-0.0711	0.2585***	0.3285***	0.1865*	0.1268**	0.0707	0.2035**
	(0.062)	(0.085)	(0.088)	(0.039)	(0.053)	(0.057)	(0.075)	(0.116)	(0.099)	(0.061)	(0.083)	(0.087)
Openness_to_experiences	0.0629	0.1569*	-0.0699	0.0717*	0.1358***	0.0038	0.0844	-0.0159	0.2166*	0.0888	0.1436*	-0.0134
	(0.061)	(0.087)	(0.082)	(0.037)	(0.051)	(0.054)	(0.084)	(0.107)	(0.131)	(0.060)	(0.078)	(0.093)
Total years of schooling	0.4510***	0.4389***	0.4546***	0.3668***	0.3774***	0.3529***	0.3970***	0.4646***	0.3300***	0.4269***	0.4144***	0.4254***
of parents	(0.028)	(0.040)	(0.040)	(0.020)	(0.028)	(0.030)	(0.045)	(0.064)	(0.066)	(0.033)	(0.051)	(0.043)
Observations	1,445	815	630	1,754	918	836	717	389	328	857	467	390
R-squared	0.162	0.163	0.169	0.194	0.224	0.144	0.155	0.178	0.146	0.189	0.143	0.271

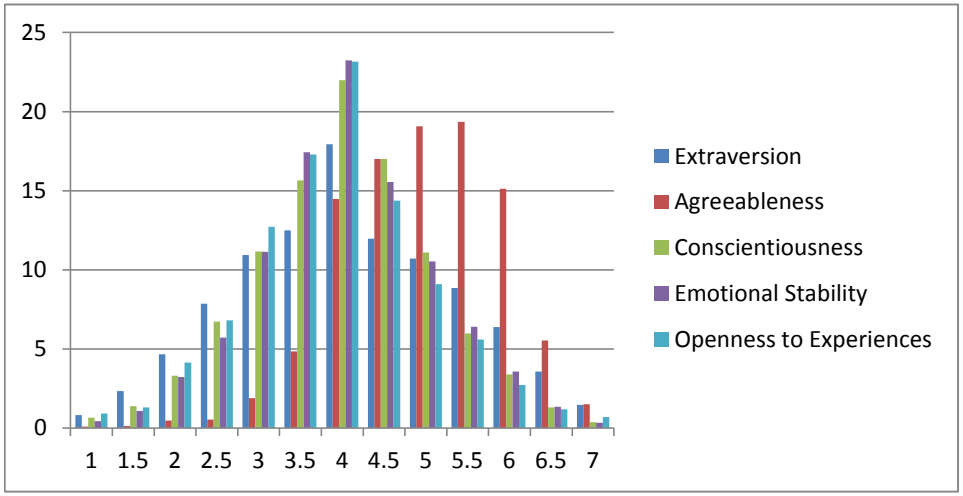
Dependent variable: Log (annual earnings)

Regression Model: OLS	**Japan** Male Base	(Male) Age>= Mean	Age< Mean	**Japan** Female Base	(Female) Age>= Mean	Age< Mean	**US** Male Base	(Male) Age>= Mean	Age< Mean	**US** Female Base	(Female) Age>= Mean	Age< Mean
Big 5 Personality												
Extraversion	0.0348***	0.0488**	0.0182	0.0389*	0.0583	0.0193	0.0048	0.0264	-0.0416	0.0521*	0.0691*	-0.0020
	(0.013)	(0.019)	(0.018)	(0.021)	(0.039)	(0.024)	(0.024)	(0.038)	(0.034)	(0.028)	(0.035)	(0.046)
Agreeableness	0.0368**	0.0542**	0.0231	-0.0359	-0.0733	-0.0149	-0.0789**	-0.0864	-0.0698*	-0.0887**	-0.0872*	-0.1003*
	(0.018)	(0.026)	(0.024)	(0.029)	(0.048)	(0.034)	(0.032)	(0.060)	(0.036)	(0.035)	(0.051)	(0.052)
Conscientiousness	0.0471***	0.0432*	0.0510***	0.0310	0.0176	0.0493*	0.1089***	0.1313**	0.0719*	0.0393	0.0555	0.0446
	(0.016)	(0.026)	(0.019)	(0.024)	(0.039)	(0.029)	(0.035)	(0.058)	(0.042)	(0.042)	(0.054)	(0.078)
Emotional_stability	-0.0246	-0.0725***	0.0267	0.0481*	-0.0049	0.0656**	0.0323	-0.0085	0.0781**	0.0922***	0.1220**	0.0966*
	(0.016)	(0.025)	(0.021)	(0.026)	(0.047)	(0.030)	(0.031)	(0.046)	(0.038)	(0.034)	(0.047)	(0.057)
Openness_to_experiences	0.0088	0.0176	0.0107	0.0234	0.0423	-0.0133	0.0145	-0.0022	0.0432	-0.0053	-0.0559	0.0717
	(0.017)	(0.024)	(0.022)	(0.026)	(0.042)	(0.031)	(0.031)	(0.045)	(0.048)	(0.033)	(0.045)	(0.058)
Total years of schooling	0.0418***	0.0237*	0.0466***	0.0401**	0.0242	0.0285	0.0619***	0.0740***	0.0800***	0.0949***	0.1144***	0.0755**
of parents	(0.009)	(0.014)	(0.014)	(0.018)	(0.035)	(0.021)	(0.015)	(0.027)	(0.022)	(0.020)	(0.028)	(0.034)
Observations	1,102	566	536	892	398	494	393	195	198	377	197	180
R-squared	0.323	0.414	0.297	0.253	0.280	0.392	0.434	0.451	0.511	0.423	0.543	0.425

Note: The mean age is 50 in both Japan and the US. For the analyses of educational attainment (upper panel) estimations are controlled by socioeconomic variables (age, age squared) and for the analyses of earnings (below panel), estimations are controlled by socioeconomic variables (years of potential experience and its squared, occupation, type of employment, company size, and years of employment at the current work place). Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

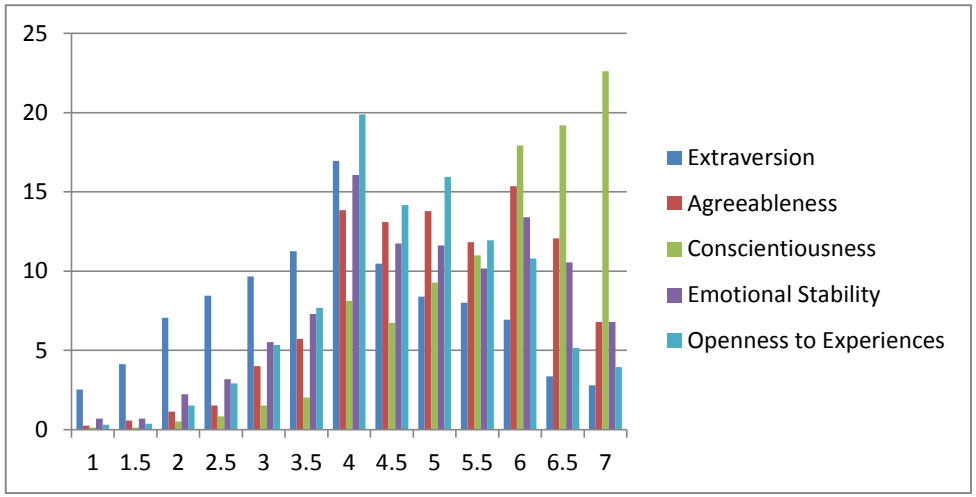
Figure1. Distribution of Big 5 Personality

1-1. Japan



Note: Y-axis indicates the relative frequency of each personality trait (unit %), which is based on the samples used for the analysis for educational attainment (N= 3,199).

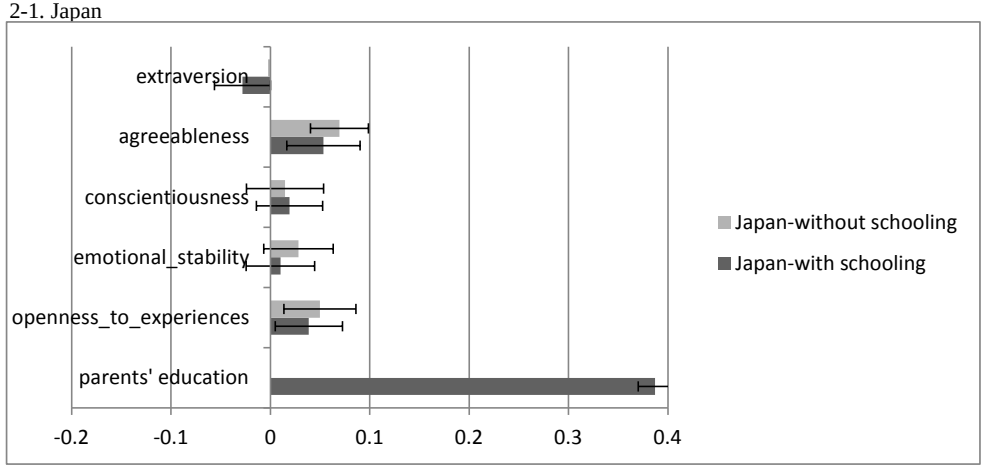
1-2. US



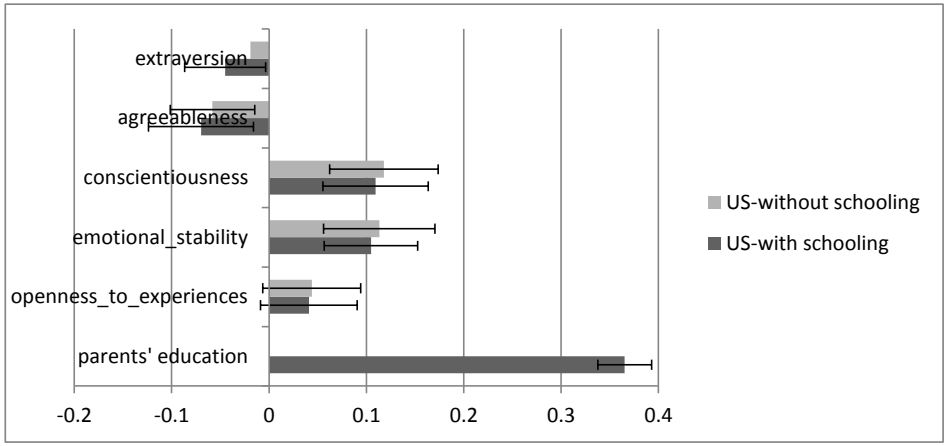
Note: Y-axis indicates the relative frequency of each personality trait (unit %), which is based on the samples used for the analysis for educational attainment (N= 1,574).

Figure 2. Standardized Regression Coefficient associated with Years of Schooling in Japan and the US

2-1. Japan



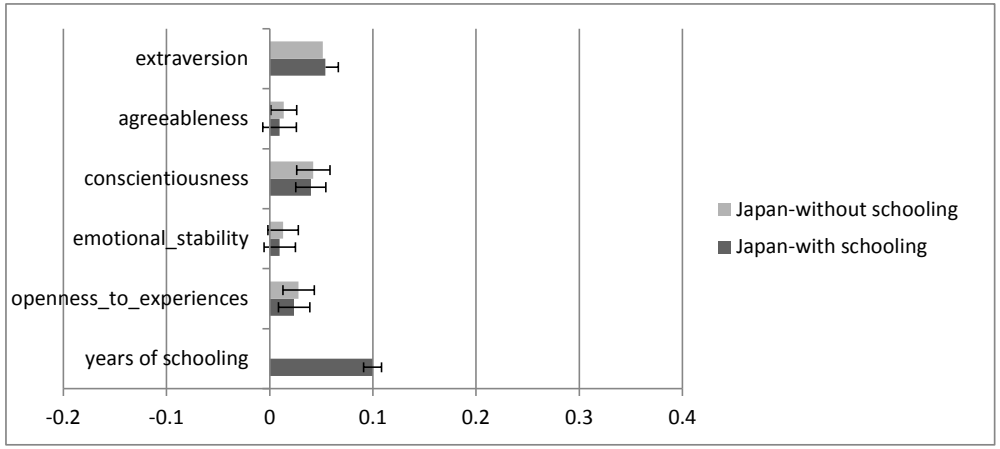
2.2. US



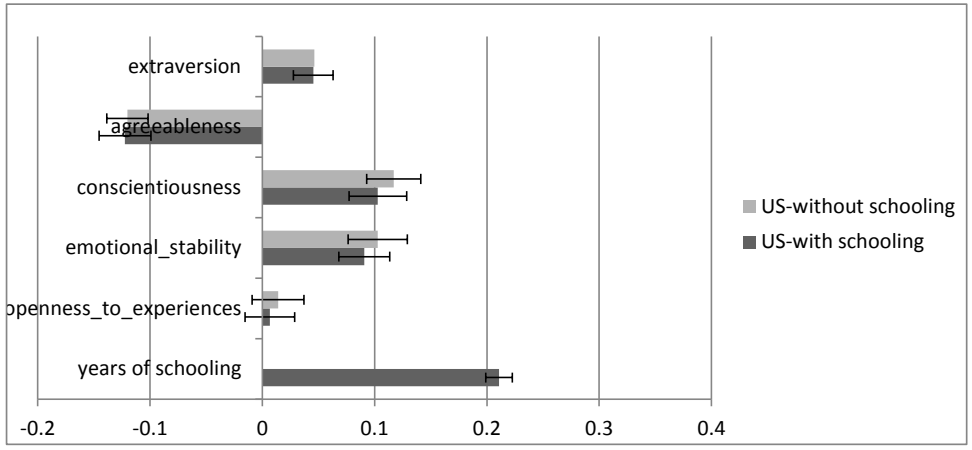
Note: The figure displays standardized regression coefficient from multivariate of years of schooling completed on the personality trait and parental education, controlling for age and age-squared and gender. The darker rectangular bars are the estimates with the control of parental educational background and the line bars represent robust standard errors.

Figure 3. Standardized Regression Coefficient associated with Earnings in Japan and the US

3-1. Japan

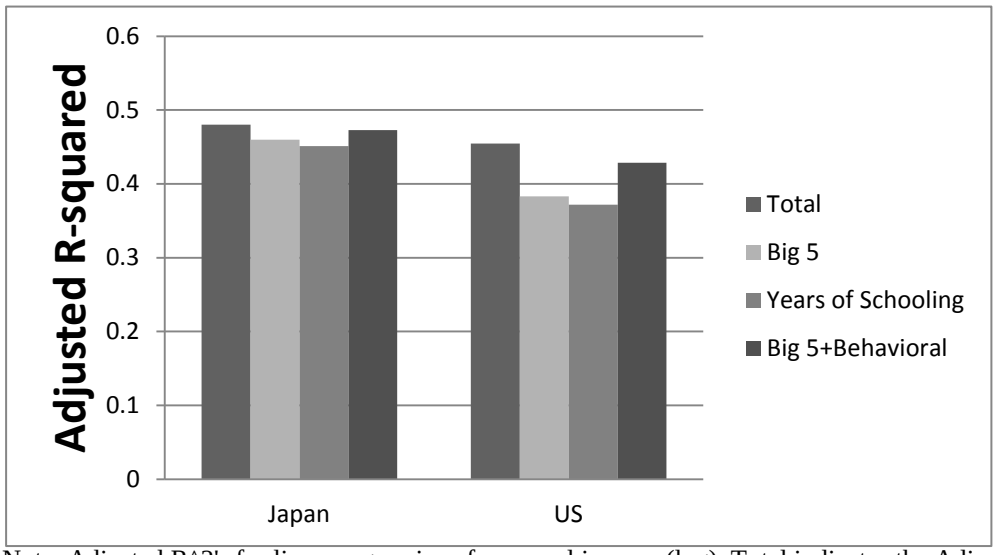


3.2. US



Note: The figure displays standardized regression coefficient from multivariate of annual income on the personality trait and one's own educational attainment, controlling for potential experience and its squared, gender, occupation, type of employment, industry, company size, and years of work experience at the current work place. The darker rectangular bars are the estimates with the control of parental educational background and the line bars represent robust standard errors.

Figure 4. Adjusted R-2 associated with Earnings in Japan and the US



Note: Adjusted R^2's for linear regressions for annual income (log). Total indicates the Adjusted R^2 when Big 5, total years of schooling, and behavioral characteristics are all included into the wage equation.

Appendix 1.

(1) Survey question that measure the degree of egalitarianism

You and a complete stranger happen to receive money. There are two ways to divide the money. You will make a decision regarding how to divide the money and the stranger will not know about it. Please indicate either Option "A" or Option "B" for all 4 cases.

Option "A"	Option "B"	→	Which ONE do you prefer? (X ONE Box For EACH Row)	
			Option "A"	Option "B"
Both receive $100	You receive $100, the other receives $60		1	2
Both receive $100	You receive $160, the other receives $40		1	2
Both receive $100	You receive $100, the other receives $180		1	2
Both receive $100	You receive $110, the other receives $190		1	2

(2) Survey question that measure the degree of overconfidence

(2-1) The level of confidence

I know a lot about sports 1 2 3 4 5

(2-1) Corrected answers to the practical questions

Please indicate whether each statement below is True or False? (Write True or False for each)

( ) The Pittsburgh Steelers have appeared in the most Super Bowls.
( ) Chicago was a candidate city for the 2016 Summer Olympics.
( ) Tyson Gay finished in second place after Usain Bolt in the 100 meters at the World Championships in Berlin in August 2009.
( ) Arthur Ashe is the only African-American player ever to win the men's singles at Wimbledon.
( ) In major league baseball, Al Simmons reached 2000 hits in fewer games than Ichiro.

(3) Survey question that measure time discounting rate

Let's assume you have two options to receive some money. You may choose Option "A", to receive $100 today; or Option "B", to receive a different amount in seven days. *Compare the amounts and timing in Option "A" with Option "B" and indicate which amount you would prefer to receive for all 9 choices.*

Option "A"	Option "B"	*Includes An Annual Interest Rate Of:*	→	Which ONE do you prefer? (X ONE Box For EACH Row)	
Receiving today	Receiving In 7 Days			Option "A"	Option "B"
$100	$99.81	-10%.		1	2
$100	$100.00	0%		1	2
$100	$100.19	10%.		1	2
$100	$100.76	40%		1	2
$100	$101.91	100%		1	2
$100	$103.83	200%		1	2
$100	$105.74	300%		1	2
$100	$119.17	1000%		1	2
$100	$195.89	5000%		1	2

Let's assume that you were required to spend time cleaning a park. You need to spend two hours this Sunday and next Sunday. It seems that the litter in the park will decrease more than expected, so the number of hours you need to clean will be less. To account for this change, you have the option to shorten the hours by one hour this Sunday or shorten some hours next Sunday. Compare the hours and timing below in Option "A" with Option "B" and indicate for each row which option you prefer.

Option "A"	Option "B"	→	Which ONE do you prefer? (X ONE Box For EACH Row)	
(Shorten this Sunday)	(Shorten next Sunday)		Option "A"	Option "B"
1 hour	50 minutes		1	2
1 hour	1 hour		1	2
1 hour	1 hour 5 minutes		1	2
1 hour	1 hour 10 minutes		1	2
1 hour	1 hour 15 minutes		1	2
1 hour	1 hour 20 minutes		1	2
1 hour	1 hour 30 minutes		1	2
1 hour	2 hours		1	2

(4) Survey question that measure risk aversion

Which of the following two ways would you prefer to **receive your monthly income**? Assume that your job assignment is the same for each scenario. If you are a dependent (e.g. student, housewife, etc.) and not working, please answer based on your monthly income being your actual living expenses. **(X ONE Box)**

Your monthly income has a 50% chance of doubling, but also has a 50% chance of decreasing by 30%
(Answer A) ***or*** Your monthly income is guaranteed to increase by 3% **(Answer B)**

A. Of the following two jobs, which would you prefer? **(X ONE Box)**
① A job that has a 50% chance of the monthly income doubling, but also a 50% chance of the monthly income being cut in half ( )
② A job that has a 50% chance of the monthly income doubling, but also a 50% chance of the monthly income decreasing by 10% ( )

B. Of the following two jobs, which would you prefer? **(X ONE Box)**
① A job with which your monthly income is guaranteed to increase by 3%( )
② A job with which your monthly income is guaranteed to increase by 3%( )

(5) Survey question that measure big 5 personality

Please circle ONE applicable number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other. (X ONE Box For EACH)

	I see myself as	Disagree Strongly	Disagree Moderately	Disagree A Little	Neither Agree Nor Disagree	Agree A Little	Agree Moderately	Agree Strongly
A.	Extraverted, Enthusiastic	1	2	3	4	5	6	7
B.	Critical, Quarrelsome	1	2	3	4	5	6	7
C.	Dependable, Self-Disciplined	1	2	3	4	5	6	7
D.	Anxious, Easily upset	1	2	3	4	5	6	7
E.	Open to new experiences, Complex	1	2	3	4	5	6	7
F.	Reserved, Quiet	1	2	3	4	5	6	7
G.	Sympathetic, Warm	1	2	3	4	5	6	7
H.	Disorganized, Careless	1	2	3	4	5	6	7
I.	Calm, Emotionally stable	1	2	3	4	5	6	7
J.	Conventional, Uncreative.	1	2	3	4	5	6	7