Toward the Integration of Personality Theory and Decision Theory in the Explanation of Economic and Health Behavior

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Abstract

Personality psychology and economics have taken different approaches to understanding individual differences, with the former emphasizing variables derived from factor analysis, and the latter emphasizing variables derived from decision theory. In a data set of trucker trainees in a large USA company, we compare the predictive power of measurements derived from decision theory and personality theory. We show that personality traits have a comparable or stronger predictive power than economic preferences for several dependent variables, in particular for credit score, job persistence and heavy truck accidents. They also have strong predictive power for Body Mass Index (BMI) and smoking habit. For example, cognitive ability explains a substantial part of the attitude to time preferences, and cognitive ability and Extraversion together explain attitude to risk.

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1. Personality Theory and Decision Theory

Two prominent approaches to understanding human behavior are decision theory, emanating originally from Economics, and personality theory, emanating from Psychology. The research we present here is a first step in the attempt, as initially proposed in Rustichini(2009), to integrate the different views of human behavior generated by these two approaches.[6]Both approaches were designed to provide a comprehensive description of important influences on behavior. However, the variables used to predict behavior in classical decision theory are derived from the *a priori* analysis of rational behavior, whereas personality theory typically derives its variables empirically, from patterns of correlation in measurements of the frequency and intensity of a wide variety of behaviors.

Decision theory in its classical form focuses on choices individuals make among options, which typically are payments subjects to uncertainty and at different points in the future. For example, an individual may have to choose among an earlier and smaller payment and a later, larger payment. Or he may have to choose between a sure amount (say the payment of 45 dollars for sure) or a random payment, called lottery, (say the payment of 100 dollars with 50 per cent probability, and zero with the complementary probability). Combinations of these two basic components are possible: an individual

[6] Borghans et al. (2008) similarly called for research attempting to integrate personality and decision theory. Our approach is distinguished from theirs in part by the theoretical position that cognitive skills

may have to choose between two lotteries at two different points in time. The preferences of an individual over options like the ones we described are summarized by a utility function, which assigns a single number to each option; the individual chooses the option with the largest number. Decision Theory identifies the essential elements determining behavior as two attitudes, one towards decision making under uncertainty and the other towards the allocation over time of rewards and penalties. When very specific functional forms are assumed for an individual's utility, that individual is completely described by a risk aversion level and a discount factor. Extensions of the simple theory, like Prospect Theory (Kahneman and Tversky (1979)) or the theory of ambiguity aversion (Ellsberg (1961), Schmeidler (1989)), increase the number of parameters and the complexity of the representation of preferences, but the basic structure is unchanged.

In personality psychology there is a reasonably widespread consensus that only five or six dimensions underlie the major patterns of covariation in human behavior. The Five Factor Model is the most widely used and well-validated taxonomy of personality traits, using five dimensions (the "Big Five") to describe personality: Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness/Intellect (John, Naumann, & Soto, 2008). Scores of an individual on the Big Five characterize his or her stable pattern of actions, thoughts, and feelings, and can be used to predict the individual's behavior. However, personality theory also specifies that personality traits are organized hierarchically, such that each of the Big Five traits subsumes multiple lower level traits (typically called *facets*), with unique variance not entirely explained by

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should be considered as an integrated component of an individual's personality, rather than as categorically distinct from personality (DeYoung, 2011).

the Big Five. Thus, although five dimensions are thought to provide a reasonably comprehensive description of an individual's characteristics, they are not intended to be exhaustive.

Because personality and decision theory appear to identify distinct sets of enduring human characteristics, one approach to integrating them is simply to take their union. This provides an *ad hoc* model of human nature, in which seven parameters describe an individual and predict his or her behavior. If we want to distinguish, within the decision-theoretic traits, between the attitudes toward risk in gains versus in losses (as we will here) we have eight parameters; if we add facets, more narrow traits within the broad domains from personality theory, the number is even larger. We apply this *ad hoc* model to an extensive set of data from a large-scale behavioral economic field study with 1,065 trainee truck drivers, combined with information about the behavior of subjects on the job for up to two years (Burks *et al.*, 2008; Burks *et al.*, 2009). Our strategy for integrating personality and decision theory is to begin by relating the components of each theory to each other and comparing their predictive power. This information then guides the beginnings of a synthesis.

The advantage of the data used here is that they contain measures of all the characteristics in the *ad hoc* model, so we can examine how these traits relate to each other, while controlling for the sorts of demographic characteristics economists normally use in human capital models. In addition, we have data on three contemporaneously measured life outcomes, smoking status, body mass index, and credit score, as well as data on two key longitudinal outcomes: (1) the length of job attachment and reason for departure, in a high-turnover setting with a financial penalty for early exit, and (2) the

number of truck accidents, controlling for week-by-week variations in the exposure to accident risk. These dataallow examination of how the different traits in the *ad hoc* model predict, or fail to predict, different outcomes.

1.1. The Big Five in a Theoretical Context

The Big Five model itself is not typically considered a theory,as it was created to provideonly a description of personalityrather than an explanation of the sources of its dimensions. In order to develop a theory of the Big Five, what is needed is to identify the psychological mechanisms that generate the regularities in behavior described by each dimension (DeYoung, 2010a, 2010b). A number of researchers have proposed mechanisms associated with the Big Five, with a reasonable degree of agreement (Denissen&Penke, 2008; DeYoung, 2010a; DeYoung et al., 2010; Nettle, 2006; Van Egeren, 2009). In this theoretical scheme, Extraversion reflects sensitivity to reward, both incentive (i.e., cues that indicate the possibility of reward) and consummatory (i.e., reaction to receiving reward). Extraversion is often expressed in a social context because many of the most important human rewards are social (e.g., social status or social affiliation), but Extraversion also encompasses the general tendency toward positive affect. Neuroticism reflects reactivity to threat and punishment and manifests in the experience of negative affect and associated cognition such as self-consciousness and rumination. Agreeableness reflects the tendency toward altruism and cooperation, as opposed to exploitation and disregard of others. Conscientiousness reflects the ability and tendency to exert control over behavior and impulses in order to follow rules and pursue nonimmediate goals. Openness/Intellect reflects the ability and tendency to seek, detect, comprehend, and utilize patterns of information, both sensory and abstract.

Because the Big Five are designed to be reasonably comprehensive, this theoretical approach may offer an adequate list of major types of psychological function in which there is substantial variation between individuals. Further, the mechanisms that are hypothesized to generate behaviors for each of the Big Five must be specifiable as components of a single mind and brain, which means that they must interact within the individual to produce behavior (Block, 2002; DeYoung, 2010b; Van Egeren, 2009). These premises provide an important motivation for integrating decision theory and personality theory. The variables described by decision theory should be explicable in terms of and in relation to theset of mechanisms associated with the Big Five. If they cannot be, this poses a problem for personality theory.

1.2. The Big Five Hierarchy

Before proceeding to our hypotheses, we further explicate the hierarchical structure of personality associated with the Big Five, which guided our selection of personality measures from those available within our sample. The sample completed the Multidimensional Personality Questionnaire (MPQ; Tellegen & Waller, 2008) rather than an instrument designed to measure the Big Five. However, the 11 subscales of the MPQ can be mapped onto the Big Five (Markon, Krueger, & Watson, 2005). The personality hierarchy organizes a large number of facet-level traits within the Big Five. There is no consensus as to the number and identity of facets in each domain. However, a level of personality structure has been empirically identified between the Big Five and their facets, which indicates that each of the Big Five can be divided into two separate but correlated *aspects* (DeYoung, Quilty, & Peterson, 2007; Jang et al., 2002). These aspect-level traits provide basic, important distinctions between different lower-level

traits in the Big Five, and can predict outcomes divergently. For example, the two aspects of Agreeableness, Compassion and Politeness, predict political attitudes in opposite directions (Hirsh, DeYoung, Xu, & Peterson, 2010).Extraversion is divided into an Assertiveness aspect, reflecting drive, leadership, and dominance, and an Enthusiasm aspect reflecting sociability and positive emotions. The MPQ scales Social Potency and Social Closeness correspond to the two aspects of Extraversion and have opposite effects on self-confidence and over-confidence (Burks *et al.*, 2010b). For our study, the two aspects of Conscientiousness are particularly important. Conscientiousness has long been conceptualized as having an inhibitive side and a proactive side (Costa, McCrae, & Dye, 1991), and these correspond to the aspects Orderliness and Industriousness identified by DeYoung et al. (2007).

Also important for our study is the division of Openness/Intellect into distinct aspects of Intellect and Openness. This division allows for a more thorough integration of the concept of intelligence within standard personality models than has previously been available (DeYoung, 2011; DeYoung, Grazioplene, & Peterson, in press). Descriptors of intelligence fall within Openness/Intellect in factor analyses that reveal the Big Five (Goldberg, 1990; Saucier, 1992). Additionally, of the Big Five, only Openness/Intellect is positively associated with ability tests of intelligence (Ackerman & Heggestad, 1997; DeYoung, 2011), and intelligence test scores sometimes fall within Openness/Intellect in factor analysis (DeYoung et al., in press). However, when the Big Five dimension was construed simply as Openness to Experience, intelligence did not appear to have much conceptual overlap (McCrae & Costa, 1997). Recognizing Intellect as a distinct aspect of the domain makes the overlap more apparent. Items from the

Intellect factor describe both intellectual engagement (e.g., “Avoid philosophical discussions”–reversed) and perceived intelligence (e.g., “Am quick to understand things”).When both Intellect and Openness are used as simultaneous predictors, only Intellect is associated with intelligence tests, and when Openness and Intellect are separated in factor analysis, intelligence loads only on Intellect (DeYoung et al., in press; DeYoung, Quilty, Peterson, & Gray, in press; DeYoung et al., 2009). Because of the established importance of intelligence for predicting economic outcomes and variables, and because the MPQ does not contain a scale corresponding to Intellect, we utilized cognitive ability tests to assess this class of personality traits. Some have argued that personality encompasses only typical behavior, not ability, but this has never been an assumption of the Big Five model. Abilities influence typical behavior, and traits involving abilities can also be found in Big Five domains other than Openness/Intellect (e.g., ability to resist distraction in Conscientiousness, or ability to empathize in Agreeableness).

1.3. Hypotheses: personality traits and economic preferences

The link between personality characteristics and economic preferences has been analyzed in recent literature in psychology and economics, and some preliminary conjectures can be proposed. Time preferences are reliablyrelated to intelligence.Higher intelligence is associated, everything else being equal, with a higher willingness to postpone the acquisition of a reward. Meta-analysis of 26 effect sizes found a negative correlation of r = -.23 between intelligence and patience in delay discounting tasks (Shamosh & Gray, 2008). The same negative correlation has been found by Burks *et al.*(2009), using the data we consider here, in choices of subjects who had to choose

between an earlier (not necessarily immediate) payment and a later and larger one. The effect of intelligence was similar on both choices in which the earlier payment was immediate and those in which it was not. Looking for the mechanisms supporting this association, Shamosh *et al.* (2008) assessed intelligence, performance in a working memory (WM) task, and hypothetical choices in a delay discounting (DD) task in a large sample of healthy adults ($N = 103$). Subjects chose between immediate and delayed payments in all choices. The behavioral findings confirmed the negative association between patience (choice of the later payment) in the DD task and both intelligence and WM performance. Additionally, subjects' brains were scanned with fMRI as they were performing the WM task, and task-related neural activity in the left anterior prefrontal cortex was associated positively with intelligence ($r = .26$) and negatively with delay discounting ($r = -.40$). These and other results suggest that preferences over time delays in monetary payments are correlated with intelligence because of the recruitment of brain regions that perform abstract information processing and integration.

One might hypothesize that both Conscientiousness and Extraversion should also be associated with DD. Conscientiousnessdescribes behaviors related to self-control and avoidance of distraction in favor of longer term goals. However, at least one study reports no association of Conscientiousness with DD (Hirsh, Morisano, & Peterson, 2008). In contrast, several studies find positive correlations between DD and questionnaire measures of impulsivity, which is often considered to mark the low pole of Conscientiousness (Hinson, Jameson, & Whitney, 2003; Ostaszewski, 1996; Richards, Zhang, Mitchell, & de Wit, 1999; Swann, Bjork, Moeller, & Dougherty, 2002).To the extent that Extraversion reflects sensitivity to rewards, higher Extraversion might

increase the tendency to pursue immediate rewards when available, and at least two studies report correlations between Extraversion and DD (Hirsh et al., 2008; Ostaszewski, 1996).

Attitudes to risk appear to be primarily affected by Neuroticism: a higher Neuroticism score is associated with a higher aversion to risk and uncertain outcomes. Some evidence supporting this link is provided by studies linking Neuroticism to the response to experienced uncertainty. For example, Hirsch and Izlicht (2008) study the feedback-related negativity (FRN), an evoked potential peaking 250 ms after the receipt of feedback information for positive, negative and uncertain feedback (in the latter case, the subject was not told whether he had succeeded in the assigned task or not). A larger FRN is found to be associated with the receipt of negative than positive feedback, but more important for our present purposes, the uncertain feedback produced an even larger response than a negative one in individuals with a larger Neuroticism score.

This channel might not be exclusive. First, other personality traits may affect the aversion to risk; higher cognitive skills are associated with higher willingness to take calculated risks (i.e. those that represent fair or better-than-fair gambles for small stakes): evidence in this direction is in Burks *et al.*(2009).[7] Second, aversion to risk is a complex trait, and individuals may differ along more than one dimension; for instance, the degree of risk aversion may vary with the stakes (that is, choices may not be invariant under scaling of the outcomes), and personality traits may affect this response.

[7] We use the term "fair gamble" in the standard way: when one chooses between a lottery and a fixed payment, a fair gamble is a lottery with an expected value equal to the fixed payment; in a better-than-fair gamble the expected value is greater than the fixed payment.

Also the degree of risk aversion may vary depending on reference points. When this point is the zero outcome risk aversion may be smaller in the loss domain (as systematized in Prospect Theory (Kahneman and Tversky, (1979)). Intelligence may modulate in part the difference in behavior in the two domains. For example, Rabin and Georg Weizsacker (2009) show theoretically and experimentally that an individual who treats decisions separately (for example in gain and loss domain) will make sub-optimal (dominated) choices. Finally the degree of aversion to risk may be modulated by the difference in the perceived precision of the probability assigned to outcomes, or by the degree of familiarity of the individual with the events describing outcomes. This latter set of factors has been modeled in economic theory under the concept of ambiguity aversion (Ellsberg (1961), a feature of individual preferences that might also be affected in different ways by several distinct personality traits.

1.4. Hypotheses: personality traits and economic behavior

There is growing evidence available of the link between personality traits and economic performances. The reviews of Ozer and Benet-Martinez, (2006), and Roberts *et al.*(2007) have recently added to our understanding of the predictive power for important life outcomes provided by personality measures; Onesand and Viswesvaran (1998) focus on the link with performance. Roberts *et al.* review the predictions of three critical outcomes: mortality, divorce, and occupational attainment, on the basis of information about individual personality traits and conclude that the predictive power is comparable to that of cognitive skills and socio-economic status. For example, Conscientiousness, Extraversion and Neuroticism have weak but significant correlation with mortality. With respect to divorce, Agreeableness, Conscientiousness and Neuroticism have a correlation

of between 10 and 20 per cent. With regard to occupational outcomes, the standardized beta weights of personality traits were on average more than 20 per cent; for comparison, the weight for IQ was slightly higher than 25 per cent.

2. Experimental Design

In this study we examine the statistical relationship between personality traits and economic preferences, and compare the effects of personality traits and economic outcomes on three contemporaneously-measured life outcomes (smoking status, body mass index, and credit score), as well as on two important longitudinally-measured outcomes: the length of job tenure and reason for departure in a high-turnover setting with a financial penalty for early exit, and the number of truck accidents, controlling for week-by-week variations in the exposure to accident risk. Our data set also contains socio-economic and demographic variables that allow us to control for the effects of the factors economists use when constructing human capital models.

2.1. Method

Initial data (all the contemporaneous measures) were gathered upon intake into the study between December 2005 and August 2006 from 1,065 truck driver trainees at a Midwestern training facility of a large motor carrier. Longitudinal measures (data on accidents and the operational factors affecting the exposure to the risk of accident, and on separations from employment) were collected from the firm for each subject for the following two years, or until first exit, whichever came first. Ninety-one percent of the firm's trainees offered the chance to participate in the study did so. During the initial data collection there were between 18 and 30 participants in each participant group. The data collection was in the form of two sessions of two-hours each, with a short break in

between. The first session involved five distinct activities, and the second six; eight were economic experiments, and three were questionnaires. In addition to a show-up fee of $10 at the beginning of each of the two sessions, in all of the experimental components participants had appropriate monetary incentives. Subjects earned between $21 and $168 in total over the two sessions, with an average of $53. Some details of the design and the context can be found in Section 10, an Appendix on this topic, and full account of the entire project is available in Burks *et al.* (2008).

2.2. Socio-economic characteristics

The socio-economic characteristics on which we have information are gender, age, ethnicity and education. The gender of the subject is described by the variable Female. The second is ethnic background, described by the dummy variables African-American, Native American, Asian, Latino, and by Multi-Ethnic (which includes any other group). The omitted category is White. Marital Status is described by four categories: Separated, Divorced, and Single and Never Married; the omitted category is Married. The variable Age is in years, Age^2 is its square. Information on education is represented by the following dummy variables: Less than high school, Some college, and BA or more, the omitted category is High School.

2.3. Economic Preferences

The measures of the attitude towards risk are derived from choices made by subjects in a laboratory experiment. They were asked to choose between a lottery and a certain amount, six times. In each choice the lottery was the same, and the certain amount was varied. This task was repeated four times; in two of these times the outcomes of the lotteries were all positive, and we refer to these as Gain lotteries and choices. The other

two times the task was repeated, one of the outcomes of the lottery was negative (so subject could incur a small loss, of $1 or $5, respectively); these are the Loss lotteries. In the Gain lotteries and the Loss lottery with one outcome of -$1, out of the six choices a risk neutral individual would choose the mixture {lottery, fixed payment} either of {4,2} or of {5,1}. In the Loss lottery with one outcome of -$5, a risk neutral individual would choose the mixture {lottery, fixed payment} either of {2,4} or of {1,5}. The attitude to ambiguity was measured with the same set of lotteries, but with the probabilities of the lottery outcomes not fully specified. All subjects were paid for one of their randomly selected choices in this activity.

The measure on acceptance of delay in payments is also derived from choices. Subjects were asked to choose seven times between an earlier smaller payment and a later larger payment. The times in the tasks were today vs. tomorrow, today vs. six days from today, two days from today vs. 6 days from today, and two days from today vs. four weeks and two days from today. These times of payment were chosen because subjects would still be at the training school for all but the longest-delayed payment (four weeks plus two days, which the University promised to pay by mailing a certified check to an address collected on the spot from winners). Two subjects in each group were selected at random and paid for one of their randomly selected choices on this activity.

The Risk Acceptance in Gains is the number of times the subject chose the lottery over the certain amount in the gain choices; the Acceptance in Losses is the corresponding value in the Loss choices. We consider the attitude to risk in the two separate cases because such attitude is significantly different. The Delay Acceptance is

the number of times the subject chooses a delayed payment over an immediate payment in the time payment task.

2.4. Personality Traits

The sample did not complete a standard Big Five measure, instead completing a short form of the Multidimensional Personality Inventory (MPQ), which consists of 11 trait scales (Tellegen & Waller, 2008). However, the MPQ scales can be mapped onto the Big Five; indeed, a factor analysis of the MPQ along with four other personality inventories (only one being a purpose-built Big Five instrument) revealed that the Big Five structure underlies all of these inventories (Markon, Krueger, & Watson, 2005). Cognitive skills (CS) were measured in three different tasks. The first was a subset of Raven's Standard Progressive Matrices (SPM), a measure of non-verbal IQ (Raven *et al.*, 2000). Subjects have to choose, out of a set of small patterned shapes, the one that matches a gap in a larger patterned shape. The second task was part of a standard test for adults of quantitative literacy, or "numeracy," from the Educational Testing Service. Subjects had to interpret text and diagrams containing numerical information, and did arithmetic calculations to answer the questions. For these two measures two subjects in each group selected at random were paid for correct answers. The third measure was a simple game, called Hit 15, played against the computer. Subject and computer alternated in moving. The subjects' goal in the game was to reach a total of 15 from a varying initial number less than 15, to which the player or the computer had to add between 1 and 3 points on each round. In this task, all subjects were paid for each round they won. The personality traits measures are mostly derived from the short version of the Multidimensional Personality Questionnaire (MPQ) (Patrick *et al.*, 2002; Tellegen, 1982). Almost all of the

154 questions have the same four possible answers: Always True, Mostly True, Mostly False, and Always False, and the subject had to choose one. In addition we asked a series of other attitudinal questions in a separate survey. There were no separate payments for the surveys.

Cognitive Skill Index (CSI) is the measure of cognitive skill we use. It is computed as the first factor in the factor analysis of the Raven's score, the Numeracy score, and the score in the Hit 15 game (see also Burks et al.(2009)).[8] The Conscientiousness index is an average obtained combining scores in the Control MPQ scale and several other survey questions. The Neuroticism scale is the score on the questions on the Stress Reaction MPQ-trait. The Agreeableness scale is the reverse of the Aggression MPQ scale. The Extraversion scale is the sum of the Social Potency and the Social Closeness MPQ scales. The five personality trait measures that we have derived are normalized in the unit interval. In the sample, they have an approximately normal distribution, with slight negative skew, with mean between 0.4 and 0.7, and SD between 0.11 and 0.30.

3. Experimental results: Relating Personality and Economic Preferences

In all the regressions reported below we control for all the variables described in Section 2.2, Socio-economic Characteristics.

3.1. Correlations

First in our list of questions to investigate is the link between economic preferences and personality traits. The analysis below extends that of (Burks et al., 2009), where only cognitive skill was considered, to the entire set of Big Five factors. Table 1 below reports

[8] There was a problem with the Hit15 task that caused us to lose approximately the first 150 data points, which is why the N drops when we use it.

the pair-wise correlation coefficients between the variables. The significance (*p*-value) of the coefficient is reported in italics below the coefficient.

Insert Table 1 here

The data confirm that there is an unconditional correlation between all the main measurements of economic preferences and Openness/Intellect (measured here by CSI). The correlation is positive for willingness to take risks in the Gain domain and willingness to accept delays in payment, and negative for risk acceptance in Losses. There is a weak negative correlation between Neuroticism and Risk acceptance in gains, and between Agreeableness and Acceptance of delay. The first is natural but weak; the second could be the consequence of trust in the experimenter; alternatively, aggression could be genuinely associated with high impatience due to impulsivity and unconcern about long-term consequences of actions.In order to get a clearer picture, we have to refine our analysis. In the regressions reported below, all the variables except Age and Age^2(which are in years) are normalized to be in the range zero to 1, so the size of the coefficients are comparable.

3.2. Personality and Economic Preferences: Attitudes to Risk

In the regression of Risk Acceptance on personality traits and the control variables (see Table 2), the only significant effects come from Native American (0.101, p =0.0431) and Neuroticism (-0.158, p =0.0049) and the higher level of education (BA or more) (-0.05, p =0.056). Among the personality variables, Neuroticism has a significant effect in the expected direction of reducing the willingness to take risks (around -0.16, p =0.009). Conscientiousness affects the attitude to risk through its inhibitive side (-0.1, p =0.096).

Insert Table 2 here

The variable Risk acceptance we have considered so far is an average measure of the attitude to risk of the individual, across both gains and losses, and with higher and lower stakes. If we consider separately the effect of gains and losses, the conclusions become richer and more clear: see Table 3.

Insert Table 3 here

The overall negative effect of Neuroticism on the willingness to take risks appears to derive mostly from the effect on risk attitude in the gain domain (-0.2, p =0.003), and is weaker in the loss domain. Cognitive skills have a stronger effect in the loss domain: higher CS reduce risk acceptance with losses (-0.15, p =0.006).

A different approach is to consider a measure of risk aversion based on a power specification of the utility function, instead of the average number of times a lottery is chosen. We restrict here the analysis to choices in the gain domain, as it requires further assumptions to identify utility over the gain-loss boundary. To study the potential effect of stake size (limited, of course, by the modest range in stake variations available), we also consider separately choices with higher and smaller stakes. The coefficient of risk aversion is on average in the sample 0.57 for the higher stakes, and slightly smaller (0.25) for the smaller stakes. The results for this non-linear transformation of the previous measure are substantially similar: Neuroticism has a strong and significant effect, and cognitive skill also has a positive effect.

3.3. Personality and Economic Preferences: Attitudes towards Ambiguity

A measure of ambiguity aversion which is independent of risk aversion is hard to specify. An easier measurement is that of the possible additional aversion to (or preference for) uncertain options when the probability of outcomes is not precisely

defined. In our data the measure can be obtained as the difference between the number of times the subject chose the lottery in the risky choice task and the number of times for the otherwise identical ambiguous choice task. A larger number of risky as compared to ambiguous choices can be taken as an index of higher ambiguity aversion; so the variable, called Difference RA, is an index of ambiguity aversion. The variable is approximately normally distributed, with mean close to 0 (0.45, with a range from of -24 to 24), SD =5.82, skewness = 0.13. Regression analysis is presented in Table 4.

Insert Table 4 here

African-American and divorced status have a weak effect (larger ambiguity aversion). The only personality trait that has significant effects is Extraversion, which higher score associated with smaller ambiguity aversion. The effect is around −4 (number of choices of lottery), over a total range of 48 (standardized β coefficient equal to 8 per cent).

3.4. Personality and Economic Preferences: Time Preferences

Our simple measure of willingness to wait for delayed payments is the fraction of delayed payments that the subject chose over the total number of choice.

Insert Table 5 here

Both measures of cognitive ability, either knowledge (measured by education) or cognitive skills as measured by our index, are associated with a larger willingness to wait for larger future payments. For education, having a BA or more has a coefficient of 0.107 (p-value = 0.00548) and CSI has one of 0.343 (p-value < 0.0001); this translates to about 3 and about 9.5 more times the later payment is accepted.

Insert Table 6 here

As in the case of the attitude to risk, the results are robust to different measures of the willingness to wait. In the first two columns of Table 6 we examine separately the estimates for choice where the earlier payment is immediate and those in which it is not. In the last two columns of Table 6 we report the effects of our control variables on the two parameters, β and δ, of a model using a quasi-hyperbolic specification of the utility function (Laibson, 1997). In this model, both parameters are discount factors, but β measures the willingness to wait when the earlier of the two payments is immediate, and the δ the same willingness but when both payments are in the future. Hence β is a better measure of the impulsivity component of impatience. We observe that effect of cognitive skills is stronger on the β parameter by an order of magnitude. There may be a non-linearity or an interaction effect here, as the finding with a simpler version of this model using the same data in Burks, *et al*.(2009) was that the effects of CSI on β and δ were qualitatively similar.

3.5. Personality and Economic Preferences: Summary

In summary, our analysis strengthens the conclusion derived from the correlation analysis: the main effects of personality traits on economic preferences are the positive effect of cognitive ability on Delay Acceptance and the negative effect of Neuroticism on Risk Acceptance.

4. Experimental Results: Strategic behavior

One of the experimental tasks was a sequential Prisoner's Dilemma (PD) game. Two players are endowed with $5 each, and move one after the other. The first decides whether to transfer $0 or $5 to the second. The second player is informed of the move of

the first, and decides how much to transfer back, selecting the amount from the set {0, 1,..., 5}. The amount chosen by each subject is doubled by the experimenter before receipt by the other.[9] Choices of the subjects were elicited by the strategy method: each subject had to decide how much he would transfer as first player, and how much he would transfer back as second player, for each of the two cases of a $0 and a $5 transfer by the first player.

Before actual choices were made, the beliefs of the subjects about the moves of the others were elicited: subjects were asked what percentage of subjects would transfer $5 as first movers ("What percent of the participants do you think will send their $5?"), and the average amount that would be sent back as second players, in the two different cases ("If Person 1 does send $0–respectively, $5–what is the average amount that participants in this room will send back?"). The results of regressing beliefs on the demographic controls and personality traits are reported in Table 7.

Insert Table 7 here

Consistent with Burks, *et al.*(2009), a higher score in Cognitive Skills increases the estimated fraction of subjects that send the $5 transfer as first movers, decreases the expected amount transferred after a $0 transfer, and increases that after the $5 transfer. Similarly, a higher score decreases the amount sent after the $0 transfer, and increases that after the $5 one. Personality traits also matter. Agreeableness increases the estimated fraction of first movers transferring $5 (17.6, p-value = 0.014), and the average amount transferred after a $5 transfer is received (0.82, p-value = 0.032). It also increases significantly the amount sent in all roles: as first mover (2.4, p-value < 0.001), as second

[9] This distinguishes the sequential PD from the Trust Game, in which only the transfer from the first

mover after a $0 transfer (1.41, *p*-value = 0.003) and after a $5 transfer (1.56, *p*-value < 0.001).

Insert Table 8 here

Next we look separately atthe three decisions with a set of nested regression models. We start with just the demographic controls, then add just the personality traits, then just the economic preferences, and then both (first with unitary Conscientiousness, and then with Conscientiousness as two distinct facets). The amount transferred as first players increases (0.89, *p*-value = 0.01), as one could expect, in subjects with higher willingness to take risks; this may be expected since the response of the second mover is unknown, hence risky. But it also increases the amount sent as second mover.

Insert Table 9 here

The amount sent as second mover increases with Neuroticism, in the case of both the low transfer (0.95, *p*-value = 0.048) and the high transfer (1.03, *p*-value = 0.022) from the first player.

Insert Table 10 here

5. Economic Outcomes: Credit Score

The credit score is the FICO-98, purchased by the company from the Fair Isaac Corporation. It is available because each trainee signed a contract that is legally a credit agreement, which commits them to repay the commercial cost of the training if they do not complete one year of service after training (see Section 10, Appendix). 942 of the trainees had a credit score. The credit score in this group has a distribution over nearly the full nominal range of possible scores (407 to 821 out of a nominal range of 300 to

mover to the second is increased by the experimenter.

850), with a mean of 588.4, SD = 93.2, and median 567. The national median value was around 723 at the time of the data collection (Board of Governors, 2007), and the subprime level of creditworthiness starts somewhere between 600 and 650 on the FICO-98.[10] The other subjects were reported to have insufficient identifiable data in their credit record to permit the computation of the FICO − 98.

The distribution is not normal or log-normal: the log of the variable is skewed left (skewness 0.29) and flatter than the normal (kurtosis = 2.18). An estimate of the factors affecting the Credit Score is reported in Table 11. We do not report variables that do not reach significance even at 10 per cent level.

Insert Table 11 here

Variables describing social-economic status have some significance. These are the variables considered in the extensive analysis in the report of the Board of Governors of the Federal Reserve to the Congress. Age increases the score by a point per year of age (p-value is around 10 per cent), but the marginal effect is significantly increasing (coefficient of $Age^2$is 0.07, p-value < 0.005), so overall at the mean age the effect is two points per extra year. Being divorced decreases it by around 20 points (p-value < 0.008). College education (BA or more) increases it by around 30 to 50 points (p-value < 0.02); lower levels of education have insignificant impact. Note that gender, and all ethnic groups except African-American, have no significant effect once we introduce our personality and economic preference variables.

[10] Specific lenders define the credit score cut-off for prime versus subprime differently, and there is no single official definition; see, for example, the definition of 620 at car buying web site Edmunds.com (Clarke, 2001 (Updated: April 30, 2009); Accessed January 1, 2011).

The personality variables have an effect, marginally so in the case of Cognitive Skill (*p*-value for CSI between 9 and 11 per cent) and Neuroticism (-36.1, *p*-value = 0.1). All (we discuss Conscientiousness more in detail below) have the expected sign. Extraversion has a sizeable effect in the expected direction (-77.4, *p*-value = 0.008). The effect of Conscientiousness is significant and negative: a higher score is associated with a lower Credit Score. The effect is large and significant (-45.6 points, *p*-value = 0.04). Since Conscientiousness is an index of diligence and responsibility the result appears at first sight paradoxical. To explain it, one needs to remember the two aspects of Conscientiousness introduced earlier, and introduce them in the analysis. Once we analyze the effect of the two sides separately, the effects of these two aspects on Credit Score are natural. The proactive side, as a measure of need for achievement, has a negative effect (57.6, *p*-value = 0.012), as one might expect since the need for achievement might induce a pattern of expenses somewhat larger than the individual's means; the scrupulous and cautious side affects the score positively, although not significantly (39.2, *p*-value = 0.105).

Among the economic preferences, Risk Acceptance is not significant. If Risk Acceptance of Gains and Losses are introduced separately the effect is also insignificant (*p*-value = 0.62 and 0.54, respectively). Delay Acceptance has a sizeable effect however, and in the expected direction (36.4, *p*-value = 0.0008). Overall, the explanatory power of Personality Traits is about double that of the Economic Preferences.

Both sets of variables pass the Likelihood Ratio (LR) test. If we take the model with the control variables including the education as the null, then the LR test of the

hypothesis that the coefficients of Economic Preferences are zero has a χ^2= 14.99 (*p*-value = 0.0006); the same test for Personality Traits has χ^2= 24.26, *p*-value = 0.0002.

Insert Table 12 here

The availability of Credit score is substantially affected by education and by minority status. Having at least some college has a marginal effect between 6 and 10 per cent.

6. Economic Outcomes: Job Persistence

In this section we investigate the factors affecting the separation from the firm. Recall that there is a significant financial penalty to early exit: the trainee will owe the full commercial value of the training received if he or she separates--for any reason--from the firm before completing a year of post-training service. The first distinction is on the basis of the moment in which separation from the firm occurs.

6.1. Time of separation

Hiring occurs at the end of basic training at the training facility. A Training Exit is an exit before the end of basic training, for whatever reason. A Job Exit is an on-the-job separation after hiring, for whatever reason. We estimate a Cox proportional hazard model, where the hazard rate (the instantaneous rate of failure at time *t*, conditional on surviving until *t*) has a baseline component common to all subjects, which is then increased (shifted up) or decreased (shifted down) by an exponential of a linear function of the independent variables and the estimated parameters.[11] We report the hazard ratio

[11] More carefully, the hazard rate for a subject is the product of a baseline hazard function common to all subjects with an exponential of a linear function of that subject's variable values times the estimated parameters. Because the baseline hazard is not parameterized, but given by the data, it can have whatever time path the data provide, which increases the robustness of the model. In Burks, *et al.* {, 2008 #6} it is shown that the baseline hazard for new-to-the-industry drivers at this firm increases when the driver first works in his or her own, and then declines until the end of the training contract, when it sharply increases again.

for each variable, so a value of less than one decreases the hazard of exit (implying longer tenure), a value of one means that the variable has no effect, and a value greater than one increases the hazard of exit (implying longer tenure).

Insert Table 13 here

For Training Exits, some of the socio-economic variables, such as African-American (hazard ratio = 2.6, *p*-value < 0.0001) and Asian (hazard ratio = 6.6, *p*-value = 0.005), induce a large increase in the probability of exit. None of the others socio-economic variables does, including gender, and education. Marital status has a large (although borderline significant) effect in the case of single-and-never-married. Economic Preferences variables also do not have significant effect (for example our measure of impatience for monetary payment in time, Delay Acceptance, has *p*-value = 0.71.) Instead, Cognitive Skills substantially reduce the hazard (hazard ratio = 0.2, *p*-value = 0.003). Also the proactive side of Conscientiousness reduces the hazard (hazard ratio = 0.23, *p*-value = 0.03), while the inhibitive has no effect (*p*-value = 0.14). Neuroticism also has a very large effect (hazard ratio = 4.16, *p*-value = 0.065).

Insert Table 14 here

The picture is similar for the case of Job Exits: African American (hazard ratio = 1.31, *p*-value = 0.09) and Latinos (hazard ratio = 1.77, *p*-value = 0.085) have a larger probability of exit. For marital status, separated individuals have a substantially larger probability of exit. A substantial difference from the early exit recorded by Training Exits is the effect of Neuroticism: for the driver trainees that are left a higher score in Neuroticism does not induce a higher risk of job exit.

6.2. Reason for Separation

The second distinction is on the basis of the reason for separation from the firm. There are two reasons for this to occur: Discharge or Voluntary Quit.

Insert Table 15 here

In both cases, minorities have a higher risk.

Insert Table 16 here

The personality characteristic that affects substantially both quits and discharges is Cognitive skills. The reduction is particularly large in the case of Discharges (hazard ratio = 0.13, p-value < 0.001), but in the case of voluntary quits too the reduction is by half (hazard ratio = 0.48, p-value = 0.022).

7. Non-Economic Outcomes: Driving Accidents

Large truck accidents are inherently statistically difficult to analyze with conventional government data, since ones that are significant enough to report to the Department of Transportation are of quite low incidence, in the range of one or fewer per one hundred million miles travelled (Burks *et al.*, 2010a).[12] However, the cooperating firm keeps administrative records on all incidents in which any damage to a vehicle or a person occurs, and analysts at a captive insurance firm classify each one as preventable (due to a mixture of risk exposure and driver decisions) versus non-preventable (due only to risks outside the driver's control). In addition the firm's safety mangers classify accidents according to their potential severity, not just their actual severity, which increases the N

[12] "DOT reportable" accidents are defined as: An occurrence involving a commercial motor vehicle on a public road in intrastate or interstate commerce, which results in: 1) a fatality; 2) injury to a person requiring immediate treatment away from the scene of the accident; or 3) disabling damage to a vehicle, requiring it to be towed.

of accidents that represent serious outcomes for the driver, since the potential severity of an accident, in addition to its severity, enters into disciplinary decisions.

The measure of potential severity takes on value of 5, 15, 30, and 50, in order of increasing severity. Accidents of the lowest level of severity occur most frequently. In the period of time we are analyzing a total of 940 accidents were reported that involve the 947 drivers in our data set who have at least one week of driving after basic training. This is an average of about one per driver, but 467 (49%) of all drivers in the study had no reported accidents, while 235 (25%) exactly one accident, and the remainder (26%) had more than one accident, so the distribution is uneven.

Of the total of 940 accidents, 73 per cent were in the lowest level 5; 23 per cent in level 15, 3 per cent in level 30, and only one accident (0.1 per cent) at the most serious level 50. Examples of the lowest potential severity accidents (level 5) are hitting a fixed object (25 per cent of the cases for this level), hitting a parked vehicle (22 per cent), being stuck and needing a tow (10 per cent), damaged equipment (10 per cent), damaged property of a third party (8 per cent). Examples of the next-to-highest severity (level 30) are overturning (16 per cent), jackknife (13 per cent), being forced off the road by a third party (13 per cent), forcing a third party off the road (3 per cent). The single accident in the highest level was hitting a pedestrian. Only 83 of the total reported accidents were Department of Transportation (DOT) reportable, and so would show up on Federal government records.

In our analysis we focus on the broadest category of preventable accidents. In work not presented here we have analyzed the predictors of accident risk for a large subset (N>10,000) of the firm's drivers using the demographic, operational, and job-type factors

routinely collected in the firm's human resource and operational information technology systems.[13] In Table 17 we report the results of a set of nested Cox proportional hazard rate models of the probability of having a preventable accident of any potential severity. Each of these models includes as predictors all of the characteristics of the job that can in principle affect the level of accident risk to which the driver is exposed. Example variables are the number of miles driven in a week, the number of trip segments completed in a week, and variables that identify the type of work to which the driver is assigned, and the geographic home base location from which the driver works.[14] The first column adds only our standard human-capital-type demographic controls, the second adds the Big Five alone to demographic controls, the third adds economic preferences alone to the demographic controls, and the last two add both Big Five and economic preferences, the first with a single Conscientiousness factor, and the second with a two-facet version of Conscientiousness.

Insert here Table 17

The only ethnic category that is significant is Native American, but there are too few individuals (29) in this category for this to tell us much. Education has no effect, and the

[13] One unpublished result from this related analysis is that having a preventable accident of the lowest severity level is a positive predictor, controlling for demographics and operational risk factors, for having a later accident of higher severity.

[14] Because work assignments are made by the firm, variables measuring work characteristics such the miles per week, the trip segments per week, and the type of work, to a first approximation are measures of the way the driver's risk of an accident varies due to exogenous factors. For instance, drivers working in "dedicated service" exclusively service a particular large customer, which reduces the number of unfamiliar routes they face, compared torunning the system, or being randomly dispatched from one customer to another. Various types of dedicated service cut the risk of a preventable accident to between 40% and 67% of the baseline level (which is for the reference category of running the system). This is qualitatively similar to the reduction from the inhibitive facet of Conscientiousness (39%). The "risk-exposure-only" version of this model for the drivers analyzed herein is available from the authors upon request.

only demographic category that matters, is being single and never married. This marital status effect deserves further investigation.

Economic theory predicts an effect on the probability of accidents from the attitude towards risk of the individual, either directly (as a personal character trait), or through the effect of personal and family conditions. However, the direct effect of risk aversion in monetary payments (our Risk acceptance measure) has no predictive power for accidents. Also the measure of impulsivity provided by the estimated discount β has no effect. It appears that either there is no generalization across small monetary risks or delayed payments and actions while driving, or possibly there is an indirect connection acting through the single-never-married marital status.

However, one of the personality traits, the inhibitive side of Conscientiousness, induces a large and significant reduction of the risk (hazard ratio 0.394, (p-value = 0.008). No other traits have a significant effect. Neuroticism is a natural candidate for a reduction of risk, but it does not, and cognitive skills have no significant effect.

8. Non-Economic Outcomes: Health-Related

In the last section we report the analysis of variables measured contemporaneously with the other initial intake data which are not directly indices of economic performance, but are considered an indication of the general level of health of a person: the Body Mass Index (BMI) and smoking habits.

8.1. BMI (Body Mass Index)

The BMI index is computed according to the formula (if W is Weight and H is Height): BMI = ((703) x W)/H^2. In the sample, the BMI has mean 28.1 and SD of 6.9; the

median 27.3. The distribution of BMI is approximately log normal, (mean = 3.3, SD =0.23). Regression results are presented in Table 18.

Insert Table 18 here

Among the socio-economic and demographic variables, Age (standardized coefficient = 0.19, *p*-value = 0.008) and Age^2(-0.24, *p*-value < 0.001) have significant effects; but Education has no effect. Extraversion has a significant and positive effect (0.08, *p*-value = 0.044). Conscientiousness has a significant and negative effect (higher Conscientiousness improves the BMI Index: standardized coefficient -0.15, *p*-value < 0.0001). When we analyze the contribution of the two facets of Conscientiousness (inhibitive and proactive) the strongest effect is induced by the proactive side (-0.21, *p*-value < 0.001), whereas the inhibitive side has no significant effect (1.12, *p*-value = 0.54). Among economic preferences Delay Acceptance is a natural candidate and has been used to predict BMI, and a borderline significant effect (standardized coefficient 0.04, *p*-value between 0.05 and 0.07). If we take the model with the control variables including the education as the null, then the LR test of the hypothesis that the coefficients of Economic Preferences are zero has χ^2=6.11 (*p*-value = 0.047); the same test for Personality Traits, χ^2= 24.56, *p*-value = 0.0002.

8.2. Smoking Addiction

A second important behavior that personality traits can help predict is whether the driver trainee smokes. The training is in a short-term residential format, so the firm provides hotel rooms to trainees and therefore keeps track of the room reservations. A subject is classified as smoker if he chose a ”smoking” room, and as a non-smoker if he chose a

”non-smoking” room; a missing observation is created in all other cases. Table 19 reports the results of the analysis of the factors affecting whether a trainee smokes or not.

Insert Table 19 here

Some of the effects among the socio-economic variables are natural and expected. Education reduces the probability of smoking (the marginal effect with respect to the baseline (a High School degree). Having a BA or more reduces by 17 per cent (p-value < 0.027), some college by 10 per cent (p-value < 0.031). Among the economic and personality variables, two stand out. A higher score in Delay acceptance and a higher degree of Inhibitive side of Conscientiousness both reduce the probability of being a smoker. Here, unlike in the case of vehicle accidents, the measures constructed using small to medium monetary rewards appear to generalize across domains. The marginal effects of these two factors are similar: a reduction of 0.27 for the Delay acceptance (p-value < 0.001) and a reduction of 0.36 for Inhibitive side of Conscientiousness (p-value = 0.026). The two are significant when they are both among the independent variables, hence the effect is probably independent.

If we take the model with the control variables including the education as the null hypothesis, then the LR test of the hypothesis that the coefficients of Economic Preferences are zero has χ^2= 15.97 (p-value = 0.0003); the same test for Personality Traits, χ^2=8.35, p-value = 0.138. Cognitive skills are the insignificant in the full regression, and their explanatory power is completely absorbed by the time preferences.

9. Discussion

We have documented two main sets of results.

First, we find support for a general hypothesis that simplifies considerably the relationship between economic preferences and personality traits. The main channel between personality traits and economic preferences goes through Intelligence and Neuroticism. Intelligence affects the preferences over time delivery of rewards, increasing patience. This effect seems to be almost exclusive: other traits do not seem to affect time preferences. Neuroticism affects the attitude to risk, decreasing willingness to take risks. As we noted this result is in line with several previous findings connecting Neuroticism to a general adversity to uncertainty (Hirsch and Inzlicht (2008)). Intelligence modulates the preferences over risky choices by reducing the difference in risk aversion in gain and loss domain, hence making the overall preference for risk more consistent. Extraversion modulates the aversion to ambiguity, reducing the specific aversion to options where the probability of outcomes is less clearly defined. Several of the links we have found confirm earlier results: but by considering systematically the relation between the measures of personality and preferences we have been able to

The second main contribution of the paper is that adding personality theory to the explanatory variables, including experimental measurements of economic preferences, increases significantly the predictive power for most dependent variables. This is also true in the very important case where the dependent variables are real economic outcomes. Of course, adding variables to the list of independent variables will always increase the predictive power of a statistical model, but this appears to be an increase in the ability to explain economic behavior. Further, we find that when we compare the explanatory power of the two set of variables, they are at least similar in size, or that of

personality variables is larger. Once we have clarified that personality variables affect economic outcomes, an open and new direction of research is to determine how the effect operates. Our results indicate that this may occur in surprising way, suggesting that a deeper understanding of this connection is needed. The example of the negative effect of Conscientiousness on Credit Score, resulting from a weak or insignificant positive effect of the Inhibitive facet and a strong and negative effect of the Proactive one, suggest that this relationship is complex.

10. Appendix: Who are the subjects?

The cooperating firm operates in the "full truckload" (TL) segment of the U.S. for-hire motor freight industry. TL drivers provide point-to-point service within a region or across the continent, but normally within the U.S. They are paid by the mile to operate large tractor-trailers (maximum gross vehicle weight of 80,000 lbs., or 36,000 kg, and an overall length of 60 to 65 ft., or about 20 meters). TL drivers generally drive medium to long distances, work relatively long and irregular weekly hours, and have limited and often uncertain amounts of time off at home. The salient characteristics of this segment for economists are that it has very low entry barriers, and few, if any, economies of scale, so it is essentially perfectly competitive (Burks *et al.*, 2010a). Thus, firms have very little pricing power, and very little ability to pass higher labor costs through to customers, so the pay rates are modest.

The resulting labor market equilibrium for TL drivers, stable since the segment emerged in its modern form in the mid-eighties after the 1980 deregulation, involves high turnover, which shows that the costs of high turnover are less than the alternative of paying compensating differentials (or running trucks out of route to get drivers home more often) in order to keep more drivers longer (Burks *et al.*, 2008). Our initial intake data was collected during the boom years of 2005 and 2006, when, according to the American Trucking Associations, the annualized turnover rate at large TL firms hadn't been under 100% since they began tracking it.[15]

Like many larger TL firms, during times of economic expansion the cooperating firm

actively recruits new-to-the-industry drivers, and trains them at one or more company-operated schools. Drivers without both a commercial drivers license (CDL) and sufficient recent over-the-road experience go through a two-week residential basic training program, followed by one to four weeks hauling freight with an instructor beside them in the cab, before beginning work entirely on their own. All trainees signed a training contract, the terms of which called for an immediate repayment of the full market value of the training (on the order of $4,000) if the individual did not complete one year of service after training, for any reason.

We collected our data from trainees at a school in the upper Midwest. Of the approximately 3,000 trainees passing through the school annually we offered the opportunity to take part in the study to 1,178; of these 1,065, or 90.8%, chose to take part.

Interestingly, among our subjects we find that in a forced-choice question asking for a single response, about 50% report the most important reason they entered training was for lifestyle reasons (e.g. wanted to travel, wanted to drive a big rig, etc.), and only about 40% gave a directly economic answer (e.g. need a regular job, or like the pay). As a result, despite the high turnover rate, our subject group is likely to be broadly representative of the blue collar service-sector workforce in the U.S..

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[15] The economic recession significantly reduced TL driver turnover: the annualized turnover rate at large TL carriers bottomed out at 39% in the first quarter of 2010. However, it has been rising again since then.

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1 Tables

Table 1: **Correlation among main scales.** *CS*: Cognitive Skill; *E*: Extraversion; *N*: Neuroticism; *C*: Conscientiousness; *A*: Agreeableness; *RAccG*: Risk Acceptance in Gains; *RAccL*: Risk Acceptance with Losses; *DAcc*: Delay Acceptance.

	CS	E	N	C	A	RAccG	RAccL
CS	1						
E	0.001	1					
	(0.661)						
N	-0.06	-0.32	1				
	(0.061)	(0.000)					
C	-0.04	0.27	-0.40	1			
	(0.217)	(0.000)	(0.000)				
A	-0.03	0.05	-0.36	0.39	1		
	(0.337)	(0.083)	(0.000)	(0.0000)			
RAccG	0.10	0.007	-0.05	-0.01	-0.04	1	
	(0.001)	(0.81)	(0.059)	(0.561)	(0.108)		
RAccL	-0.14	-0.03	-0.023	-0.02	0.01	0.47	1
	(0.000)	(0.197)	(0.436)	(0.386)	(0.659)	(0.000)	
DAcc	0.22	-0.01	0.015	-0.004	0.07	0.07	0.01
	(0.000)	(0.596)	(0.731)	(0.898)	(0.018)	(0.019)	(0.732)

Table 2: **Determinants of Risk acceptance.** The dependent variable is the risk acceptance, fraction of lotteries taken instead of the sure amount, in the entire set of risky choices made.

	(1)	(2)	(3)
	b/p	b/p	b/p
Female	–0.02	–0.01	–0.01
	(0.372)	(0.718)	(0.745)
African-American	–0.03	–0.03	–0.03
	(0.203)	(0.178)	(0.288)
Native American	0.10**	0.10**	0.09*
	(0.019)	(0.042)	(0.060)
Asian	0.12	0.11	0.11
	(0.148)	(0.309)	(0.279)
Separated	–0.04	–0.05	–0.05
	(0.307)	(0.279)	(0.219)
Divorced	0.03	0.03	0.03
	(0.119)	(0.127)	(0.136)
Never Married	–0.00	–0.01	–0.01
	(0.923)	(0.622)	(0.577)
Age	0.00	–0.00	–0.00
	(0.450)	(0.681)	(0.669)
Age^2	–0.00	0.00	0.00
	(0.221)	(0.915)	(0.931)
Some College	–0.01	0.00	0.00
	(0.624)	(0.962)	(0.964)
BA or more	–0.05*	–0.04	–0.04
	(0.056)	(0.214)	(0.224)
Cognitive Skill		–0.04	–0.04
		(0.447)	(0.434)
Extraversion		–0.03	–0.04
		(0.670)	(0.577)
Neuroticism		–0.16***	–0.15***
		(0.005)	(0.009)
Agreeableness		–0.05	–0.04
		(0.324)	(0.503)
Conscientiousness		–0.06	
		(0.313)	
Inhibitive Side of Consc.			–0.10*
			(0.096)
Proactive Side of Consc.			–0.00
			(0.960)
Constant	0.64***	0.82***	0.85***
	(0.000)	(0.000)	(0.000)
r2	0.018	0.027	0.029
N	1068	861	861

Table 3: **Determinants of Risk acceptance with gains and losses, and risk aversion coefficient.** RA Gains and RA Losses are risk acceptance (fraction of lotteries taken instead of the sure amount) in gains and losses respectively. CRA Low and CRA High are the coefficents of risk aversion for higher (expected value 6 dollars) and lower (3 dollars) stakes respectively. The mean values are 0.57 (SE 0.056) for CRAHigh and 0.25 (SE 0.057) for CRALow.

	RA Gains	RA Losses	CRA High	CRA Low
	b/p	b/p	b/p	b/p
Female	0.03	–0.04	–0.22	–0.17
	(0.361)	(0.152)	(0.284)	(0.399)
African-American	–0.07**	0.02	0.37*	0.42**
	(0.015)	(0.589)	(0.065)	(0.032)
Native American	0.12**	0.07	–0.30	–0.88**
	(0.040)	(0.221)	(0.454)	(0.026)
Asian	0.03	0.19	–0.02	–0.28
	(0.784)	(0.113)	(0.979)	(0.728)
Separated	–0.06	–0.04	0.42	0.43
	(0.180)	(0.420)	(0.217)	(0.189)
Divorced	0.02	0.04	–0.18	–0.11
	(0.334)	(0.107)	(0.319)	(0.507)
Never Married	–0.05**	0.02	0.29*	0.25
	(0.047)	(0.333)	(0.077)	(0.117)
Age	–0.00**	0.00*	0.02*	0.03***
	(0.010)	(0.080)	(0.088)	(0.006)
Age^2	0.00	–0.00	–0.00	–0.00
	(0.326)	(0.425)	(0.646)	(0.407)
Some College	0.03	–0.02	–0.21	–0.19
	(0.195)	(0.242)	(0.130)	(0.162)
BA or more	0.00	–0.07**	–0.08	–0.06
	(0.997)	(0.038)	(0.728)	(0.798)
Cognitive Skill	0.08	–0.15***	–0.92**	–0.80**
	(0.140)	(0.006)	(0.016)	(0.032)
Extraversion	–0.07	–0.01	0.13	1.06*
	(0.374)	(0.925)	(0.821)	(0.065)
Neuroticism	–0.20***	–0.11	1.26***	1.33***
	(0.003)	(0.123)	(0.007)	(0.004)
Agreeableness	–0.08	0.01	0.43	0.59
	(0.186)	(0.895)	(0.341)	(0.179)
Inhibitive Side of Consc.	–0.09	–0.12	0.48	0.59
	(0.188)	(0.116)	(0.341)	(0.230)
Proactive Side of Consc.	0.00	–0.01	0.22	–0.16
	(0.941)	(0.876)	(0.635)	(0.726)
Constant	0.88***	0.81***	–0.23	–1.22*
	(0.000)	(0.000)	(0.749)	(0.080)
r2	0.059	0.044	0.049	0.066
N	861	861	861	861

Table 4: **Determinants of the difference between attitude to risk and ambiguity.** The dependent variable is the difference between the numbers of lotteries accepted in all risk choices and those accepted in all ambiguity choices.

	(1)	(2)	(3)
	beta/p	beta/p	beta/p
Female	0.01	0.03	0.03
	(0.756)	(0.361)	(0.371)
African-American	0.03	0.08**	0.08**
	(0.306)	(0.026)	(0.034)
Native American	0.00	0.01	0.02
	(0.888)	(0.670)	(0.635)
Asian	0.05	–0.01	–0.01
	(0.115)	(0.795)	(0.780)
Separated	0.01	–0.03	–0.03
	(0.851)	(0.382)	(0.375)
Divorced	0.04	0.06*	0.07*
	(0.187)	(0.081)	(0.075)
Never Married	0.01	0.01	0.01
	(0.817)	(0.867)	(0.793)
Age	–0.03	–0.08	–0.08
	(0.652)	(0.246)	(0.268)
Age^2	0.02	0.07	0.07
	(0.750)	(0.306)	(0.315)
Some College	0.03	0.03	0.04
	(0.406)	(0.371)	(0.361)
BA or more	0.02	0.03	0.03
	(0.472)	(0.437)	(0.456)
Cognitive Skill		0.03	0.04
		(0.384)	(0.357)
Extraversion		–0.08**	–0.08**
		(0.039)	(0.027)
Neuroticism		–0.03	–0.02
		(0.431)	(0.620)
Agreeableness		–0.03	–0.04
		(0.475)	(0.324)
Conscientiousness		–0.02	
		(0.596)	
Inhibitive Side of Consc.			0.01
			(0.798)
Proactive Side of Consc.			0.01
			(0.740)
Constant			
	(0.973)	(0.194)	(0.412)
r2	0.012	0.023	0.023
N	1068	861	861

Table 5: **Determinants of Delay acceptance.** Delay acceptance is the fraction of times the subjects chooses the later payment.

	(1)	(2)	(3)
	b/p	b/p	b/p
Female	0.01	–0.02	–0.02
	(0.812)	(0.464)	(0.444)
African-American	–0.14***	–0.10***	–0.11***
	(0.000)	(0.001)	(0.000)
Native American	0.06	0.03	0.04
	(0.302)	(0.611)	(0.524)
Asian	0.01	0.03	0.02
	(0.953)	(0.799)	(0.861)
Separated	–0.05	–0.07	–0.06
	(0.263)	(0.203)	(0.276)
Divorced	0.03	0.03	0.03
	(0.235)	(0.266)	(0.245)
Never Married	0.02	0.02	0.02
	(0.386)	(0.383)	(0.365)
Age	0.00	0.00	0.00
	(0.274)	(0.336)	(0.343)
Age^2	0.00	0.00	0.00
	(0.175)	(0.110)	(0.103)
Some College	0.06***	0.03	0.03
	(0.001)	(0.154)	(0.167)
BA or more	0.17***	0.11***	0.10***
	(0.000)	(0.006)	(0.007)
Cognitive Skill		0.34***	0.34***
		(0.000)	(0.000)
Extraversion		–0.02	0.00
		(0.870)	(0.971)
Neuroticism		0.05	0.02
		(0.499)	(0.753)
Agreeableness		0.09	0.08
		(0.180)	(0.282)
Conscientiousness		0.04	
		(0.579)	
Inhibitive Side of Consc.			0.13*
			(0.098)
Proactive Side of Consc.			–0.07
			(0.353)
Constant	0.53***	0.22**	0.21*
	(0.000)	(0.041)	(0.065)
r2	0.080	0.115	0.118
N	1068	861	861

Table 6: **Determinants of Delay acceptance when early payments are immediate and delayed.** The first two columns report results for DAcc Imm. (respectively DAcc Later), fraction of times the subject chose a later payment in a choice where the early payment was made immediately (at a later date, respectively). The last two report results for the estimated β and δ.

	DAcc Imm.	DA Later	β	δ
	b/p	b/p	b/p	b/p
Female	–0.00	–0.05	0.01	–0.00
	(0.915)	(0.234)	(0.440)	(0.350)
African-American	–0.10***	–0.13***	–0.04***	–0.00***
	(0.002)	(0.001)	(0.007)	(0.001)
Native American	0.06	0.02	0.02	0.00
	(0.380)	(0.750)	(0.451)	(0.458)
Asian	0.03	0.02	0.01	0.00
	(0.852)	(0.895)	(0.891)	(0.891)
Separated	–0.03	–0.08	–0.00	–0.00
	(0.524)	(0.201)	(0.995)	(0.265)
Divorced	0.04	0.02	0.02	0.00
	(0.119)	(0.539)	(0.109)	(0.455)
Never Married	0.02	0.02	0.01	0.00
	(0.404)	(0.421)	(0.565)	(0.405)
Age	0.00	0.00	–0.00	0.00
	(0.812)	(0.167)	(0.888)	(0.318)
Age^2	0.00*	0.00	0.00	0.00
	(0.100)	(0.186)	(0.136)	(0.122)
Some College	0.02	0.04	0.01	0.00*
	(0.319)	(0.143)	(0.223)	(0.073)
BA or more	0.10**	0.11**	0.04**	0.00**
	(0.015)	(0.014)	(0.022)	(0.012)
Cognitive Skill	0.32***	0.36***	0.12***	0.01***
	(0.000)	(0.000)	(0.000)	(0.000)
Extraversion	0.06	–0.06	0.03	0.00
	(0.508)	(0.615)	(0.410)	(0.943)
Neuroticism	0.06	–0.01	0.05	–0.00
	(0.416)	(0.868)	(0.132)	(0.908)
Agreeableness	0.08	0.07	0.05	0.00
	(0.248)	(0.416)	(0.133)	(0.901)
Inhibitive Side of Consc.	0.14*	0.13	0.05	0.00
	(0.088)	(0.188)	(0.128)	(0.225)
Proactive Side of Consc.	–0.06	–0.07	–0.03	–0.00
	(0.398)	(0.404)	(0.378)	(0.450)
Constant	0.29**	0.13	0.72***	0.98***
	(0.011)	(0.350)	(0.000)	(0.000)
r2	0.095	0.107	0.088	0.101
N	861	861	807	807

Table 7: **Determinants of Beliefs on others' behavior in the Sequential Prisoner's Dilemma Game.** The dependent variable in the first column is the answer to the question "What percent of the participants do you think will send their 5 dollars?"; in the second and third column, the answer to the questions "If Person 1 does send 0 (5) dollars, what is the average amount that participants in this room will send back?"

	Percent Send	Guess 0	Guess 5
	b/p	b/p	b/p
Female	–0.41	0.14	–0.03
	(0.902)	(0.441)	(0.849)
African-American	–1.10	0.03	–0.07
	(0.736)	(0.853)	(0.699)
Native American	8.78	0.09	0.36
	(0.179)	(0.807)	(0.311)
Asian	–17.66	–0.72	–2.21***
	(0.193)	(0.319)	(0.002)
Separated	–7.45	0.27	0.11
	(0.174)	(0.349)	(0.704)
Divorced	–2.35	0.12	–0.18
	(0.412)	(0.426)	(0.240)
Never Married	7.99***	0.17	0.29**
	(0.003)	(0.215)	(0.043)
Age	0.18	0.02**	0.01
	(0.360)	(0.045)	(0.460)
Age^2	–0.01	–0.00	–0.00
	(0.462)	(0.859)	(0.528)
Some College	0.77	0.07	0.11
	(0.737)	(0.545)	(0.351)
BA or more	–1.61	–0.46**	0.00
	(0.681)	(0.030)	(0.982)
Cognitive Skill	20.45***	–1.64***	0.52
	(0.001)	(0.000)	(0.130)
Extraversion	7.21	0.56	0.75
	(0.450)	(0.269)	(0.142)
Neuroticism	–10.42	0.78*	0.79*
	(0.170)	(0.055)	(0.052)
Agreeableness	18.16**	0.25	0.85**
	(0.013)	(0.523)	(0.030)
Inhibitive Side of Consc.	3.40	0.49	0.46
	(0.677)	(0.258)	(0.290)
Proactive Side of Consc.	–10.39	–0.05	–0.33
	(0.167)	(0.893)	(0.411)
Constant	15.96	1.12*	1.00
	(0.191)	(0.085)	(0.129)
r2	0.072	0.081	0.046
N	859	859	859

Table 8: **Determinants of the decision to send 5 Dollars as first mover.** Logit regressions of the variable equal to one if the subject sent 5 dollars. Marginal effects at the mean of the dependent variables.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	–0.01	–0.08	–0.01	–0.07	–0.07
	(0.808)	(0.158)	(0.841)	(0.182)	(0.189)
African-American	–0.08**	–0.05	–0.05	–0.03	–0.03
	(0.050)	(0.329)	(0.233)	(0.512)	(0.604)
Native American	–0.02	0.04	–0.05	0.02	0.00
	(0.826)	(0.699)	(0.563)	(0.879)	(0.963)
Asian	–0.04	0.00	–0.07	–0.02	–0.02
	(0.806)	(0.992)	(0.677)	(0.907)	(0.916)
Separated	–0.11	–0.02	–0.10	–0.00	–0.01
	(0.132)	(0.854)	(0.196)	(0.998)	(0.940)
Divorced	–0.04	–0.02	–0.05	–0.03	–0.03
	(0.371)	(0.608)	(0.222)	(0.463)	(0.475)
Never Married	–0.03	0.00	–0.03	0.00	–0.00
	(0.391)	(0.953)	(0.348)	(0.962)	(0.992)
Age	0.00	0.00	0.00	0.00	0.00
	(0.104)	(0.393)	(0.143)	(0.400)	(0.419)
Age^2	0.00	0.00	0.00	0.00	0.00
	(0.973)	(0.270)	(0.996)	(0.308)	(0.317)
Some College	0.09***	0.07**	0.08***	0.06*	0.06*
	(0.002)	(0.046)	(0.006)	(0.059)	(0.068)
BA or more	0.10**	0.03	0.08	0.03	0.03
	(0.044)	(0.553)	(0.120)	(0.598)	(0.636)
Cognitive Skill		0.17*		0.14	0.14
		(0.065)		(0.142)	(0.151)
Extraversion		0.00		0.00	–0.00
		(0.996)		(0.990)	(0.973)
Neuroticism		0.15		0.16	0.13
		(0.193)		(0.140)	(0.251)
Agreeableness		0.47***		0.47***	0.49***
		(0.000)		(0.000)	(0.000)
Conscientiousness		–0.24**		–0.23*	
		(0.043)		(0.050)	
Inhibitive Side of Consc.					–0.15
					(0.231)
Proactive Side of Consc.					–0.19*
					(0.100)
Delay Acceptance			0.18***	0.10**	0.10**
			(0.000)	(0.047)	(0.049)
Risk Acceptance			0.21***	0.18***	0.17***
			(0.001)	(0.008)	(0.009)
N	1068	861	1068	861	861

Table 9: **Determinants of the amount sent back by first mover, after a 0 dollars transfer.** The dependent variable is the amount sent by the subject as second mover after a transfer of 0 dollars by the first.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	0.16	0.00	0.18	0.01	0.01
	(0.445)	(0.989)	(0.384)	(0.974)	(0.951)
African-American	0.02	–0.21	0.03	–0.20	–0.15
	(0.930)	(0.320)	(0.879)	(0.349)	(0.479)
Native American	0.70*	0.40	0.60	0.31	0.27
	(0.070)	(0.351)	(0.117)	(0.467)	(0.538)
Asian	0.04	0.01	–0.07	–0.08	–0.04
	(0.951)	(0.992)	(0.921)	(0.925)	(0.967)
Separated	0.10	0.30	0.13	0.33	0.29
	(0.750)	(0.405)	(0.675)	(0.358)	(0.430)
Divorced	0.15	0.26	0.12	0.24	0.23
	(0.403)	(0.171)	(0.496)	(0.215)	(0.225)
Never Married	–0.07	–0.10	–0.06	–0.08	–0.09
	(0.667)	(0.579)	(0.683)	(0.631)	(0.601)
Age	0.03**	0.02	0.03**	0.02	0.02
	(0.015)	(0.233)	(0.017)	(0.204)	(0.208)
Age^2	–0.00	–0.00	–0.00	–0.00	–0.00
	(0.740)	(0.948)	(0.860)	(0.973)	(0.955)
Some College	–0.16	0.00	–0.15	0.01	0.01
	(0.218)	(0.984)	(0.259)	(0.957)	(0.958)
BA or more	–0.78***	–0.52**	–0.71***	–0.46*	–0.46*
	(0.001)	(0.047)	(0.003)	(0.076)	(0.078)
Cognitive Skill		–1.55***		–1.46***	–1.47***
		(0.000)		(0.001)	(0.000)
Extraversion		0.69		0.71	0.63
		(0.281)		(0.260)	(0.317)
Neuroticism		0.83*		0.99**	1.04**
		(0.085)		(0.041)	(0.040)
Agreeableness		1.37***		1.44***	1.54***
		(0.004)		(0.002)	(0.002)
Conscientiousness		–0.53		–0.47	
		(0.306)		(0.366)	
Inhibitive Side of Consc.					–0.73
					(0.177)
Proactive Side of Consc.					0.00
					(0.992)
Delay Acceptance			–0.10	–0.18	–0.17
			(0.645)	(0.435)	(0.470)
Risk Acceptance			0.99***	0.94***	0.92***
			(0.000)	(0.002)	(0.002)
Constant	1.61***	1.38*	1.03***	0.65	0.82
	(0.000)	(0.056)	(0.000)	(0.392)	(0.311)
r2	0.035	0.067	0.047	0.078	0.079
N	1068	861	1068	861	861

Table 10: **Determinants of the amount sent back by first mover, after a 5 dollars transfer.** The dependent variable is the amount sent by the subject as second mover after a transfer of 5 dollars by the first.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	–0.22	–0.36*	–0.21	–0.34*	–0.34
	(0.257)	(0.083)	(0.271)	(0.098)	(0.101)
African-American	–0.23	–0.06	–0.11	0.02	0.02
	(0.171)	(0.763)	(0.498)	(0.924)	(0.925)
Native American	–0.30	–0.51	–0.40	–0.61	–0.63
	(0.403)	(0.207)	(0.257)	(0.134)	(0.123)
Asian	–0.36	–0.44	–0.44	–0.54	–0.55
	(0.587)	(0.602)	(0.506)	(0.522)	(0.516)
Separated	–0.37	–0.04	–0.31	0.03	0.04
	(0.205)	(0.913)	(0.282)	(0.925)	(0.901)
Divorced	–0.24	–0.17	–0.28*	–0.21	–0.21
	(0.145)	(0.351)	(0.086)	(0.242)	(0.245)
Never Married	–0.08	–0.02	–0.09	–0.03	–0.04
	(0.604)	(0.896)	(0.542)	(0.875)	(0.814)
Age	0.01	0.01	0.01	0.01	0.01
	(0.415)	(0.606)	(0.520)	(0.631)	(0.678)
Age^2	–0.00	–0.00	–0.00	–0.00	–0.00
	(0.782)	(0.770)	(0.739)	(0.664)	(0.677)
Some College	0.43***	0.25*	0.39***	0.23	0.22
	(0.000)	(0.082)	(0.001)	(0.103)	(0.121)
BA or more	0.50**	0.21	0.42*	0.18	0.17
	(0.024)	(0.398)	(0.061)	(0.460)	(0.478)
Cognitive Skill		1.04***		0.89**	0.87**
		(0.007)		(0.023)	(0.026)
Extraversion		–0.07		–0.04	0.04
		(0.908)		(0.950)	(0.946)
Neuroticism		0.92**		1.01**	0.78*
		(0.043)		(0.026)	(0.096)
Agreeableness		1.57***		1.56***	1.65***
		(0.000)		(0.000)	(0.000)
Conscientiousness		–0.41		–0.39	
		(0.404)		(0.429)	
Inhibitive Side of Consc.					–0.16
					(0.758)
Proactive Side of Consc.					–0.81*
					(0.084)
Delay Acceptance			0.69***	0.51**	0.51**
			(0.000)	(0.019)	(0.021)
Risk Acceptance			0.63**	0.76***	0.75***
			(0.013)	(0.007)	(0.007)
Constant	3.49***	1.75***	2.72***	1.02	1.42*
	(0.000)	(0.010)	(0.000)	(0.149)	(0.059)
r2	0.022	0.042	0.041	0.058	0.061
N	1068	861	1068	861	861

Table 11: **Determinants of Credit Score.** The dependent variable is the credit score (FICO 98) of the subject.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	1.50	–1.16	1.11	–1.01	–1.20
	(0.871)	(0.909)	(0.904)	(0.920)	(0.905)
African-American	–58.37***	–48.39***	–54.09***	–45.54***	–50.20***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Native American	–22.47	–27.69	–24.36	–27.97	–26.14
	(0.232)	(0.206)	(0.193)	(0.200)	(0.231)
Asian	–36.12	–38.07	–35.92	–38.67	–45.02
	(0.242)	(0.332)	(0.241)	(0.322)	(0.249)
Separated	–23.29	–14.30	–21.82	–12.12	–10.23
	(0.112)	(0.397)	(0.134)	(0.471)	(0.543)
Divorced	–20.90***	–23.93***	–21.74***	–24.35***	–23.03***
	(0.009)	(0.006)	(0.007)	(0.005)	(0.008)
Never Married	5.30	9.37	4.31	8.48	9.43
	(0.466)	(0.251)	(0.551)	(0.296)	(0.245)
Age	1.01*	1.07*	0.91*	0.97	0.96
	(0.062)	(0.079)	(0.091)	(0.108)	(0.112)
Age^2	0.07***	0.08***	0.07***	0.07***	0.07***
	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)
Some College	9.20	0.15	6.84	–1.07	–1.91
	(0.122)	(0.983)	(0.249)	(0.878)	(0.785)
BA or more	49.77***	35.89***	43.78***	32.21***	29.61**
	(0.000)	(0.003)	(0.000)	(0.007)	(0.013)
Cognitive Skill		45.16**		32.32*	34.65*
		(0.020)		(0.099)	(0.077)
Extraversion		–77.08***		–75.53**	–75.47**
		(0.010)		(0.011)	(0.010)
Neuroticism		–32.94		–32.24	–39.75*
		(0.149)		(0.158)	(0.094)
Agreeableness		15.38		13.53	–1.21
		(0.491)		(0.543)	(0.957)
Conscientiousness		–50.80**		–51.28**	
		(0.037)		(0.034)	
Inhibitive Side of Consc.					39.59
					(0.117)
Proactive Side of Consc.					–57.37**
					(0.013)
Delay Acceptance			37.87***	36.32***	35.58***
			(0.000)	(0.001)	(0.001)
Risk Acceptance			–0.07	–3.20	–1.63
			(0.996)	(0.821)	(0.908)
Constant	569.82***	618.42***	549.80***	609.66***	598.43***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
r2	0.161	0.179	0.175	0.191	0.194
N	944	764	944	764	764

Table 12: **Determinants of Credit Score Availability.** Logit regressions of the variable equal to one if the credit score of the subject is available. Marginal effects at the mean of the dependent variables.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	0.01	0.03	0.01	0.03	0.03
	(0.762)	(0.308)	(0.771)	(0.290)	(0.283)
African-American	–0.09***	–0.04	–0.07**	–0.04	–0.04
	(0.008)	(0.205)	(0.023)	(0.300)	(0.309)
Native American	–0.13	–0.20**	–0.14*	–0.21**	–0.21**
	(0.114)	(0.050)	(0.087)	(0.041)	(0.040)
Latino	0.07	0.06	0.07*	0.07	0.07
	(0.115)	(0.198)	(0.093)	(0.156)	(0.150)
Separated	–0.09	–0.02	–0.08	–0.01	–0.01
	(0.153)	(0.786)	(0.187)	(0.875)	(0.865)
Divorced	–0.01	–0.00	–0.02	–0.01	–0.01
	(0.695)	(0.888)	(0.598)	(0.810)	(0.821)
Never Married	–0.03	–0.03	–0.03	–0.03	–0.03
	(0.240)	(0.268)	(0.235)	(0.279)	(0.278)
Age	0.00	0.00	0.00	0.00	0.00
	(0.122)	(0.296)	(0.130)	(0.285)	(0.293)
Age^2	–0.00	–0.00	–0.00	–0.00	–0.00
	(0.359)	(0.786)	(0.310)	(0.701)	(0.699)
Some College	0.10***	0.06***	0.09***	0.06***	0.06***
	(0.000)	(0.006)	(0.000)	(0.008)	(0.009)
BA or more	0.05*	0.04	0.04	0.04	0.03
	(0.057)	(0.228)	(0.141)	(0.287)	(0.301)
Cognitive Skill		0.10		0.08	0.08
		(0.102)		(0.183)	(0.180)
Extraversion		–0.07		–0.07	–0.08
		(0.466)		(0.457)	(0.440)
Neuroticism		0.10		0.11	0.09
		(0.189)		(0.182)	(0.262)
Agreeableness		0.01		0.01	0.01
		(0.862)		(0.931)	(0.945)
Conscientiousness		–0.09		–0.09	
		(0.272)		(0.292)	
Inhibitive Side of Consc.					–0.03
					(0.761)
Proactive Side of Consc.					–0.08
					(0.317)
Delay Acceptance			0.07**	0.06*	0.06
			(0.023)	(0.093)	(0.103)
Risk Acceptance			0.05	0.04	0.04
			(0.249)	(0.334)	(0.332)
N	1060	856	1060	856	856

Table 13: **Determinants of Training Exits from the Company.** Training Exits includes all those that did not complete basic training, for any choice-based reason, by either firm or trainee.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	1.38	1.29	1.39	1.28	1.28
	(0.234)	(0.421)	(0.225)	(0.434)	(0.429)
African-American	3.33***	2.91***	3.20***	2.84***	2.66***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Native American	0.95	0.93	0.97	0.96	1.09
	(0.927)	(0.922)	(0.960)	(0.953)	(0.909)
Asian	3.74*	7.19**	3.91*	7.41**	6.66**
	(0.077)	(0.012)	(0.067)	(0.011)	(0.015)
Latino	1.26	1.81	1.25	1.79	1.80
	(0.750)	(0.425)	(0.761)	(0.433)	(0.427)
Separated	1.11	0.81	1.10	0.78	0.80
	(0.806)	(0.731)	(0.830)	(0.690)	(0.720)
Divorced	1.10	0.99	1.11	1.00	1.01
	(0.718)	(0.961)	(0.681)	(0.994)	(0.977)
Never Married	1.57*	1.40	1.57*	1.38	1.41
	(0.066)	(0.227)	(0.066)	(0.250)	(0.219)
Age	1.11*	1.06	1.11	1.06	1.07
	(0.098)	(0.334)	(0.105)	(0.370)	(0.302)
Age^2	1.00	1.00	1.00	1.00	1.00
	(0.383)	(0.759)	(0.408)	(0.813)	(0.730)
Some College	0.96	1.11	0.98	1.14	1.14
	(0.847)	(0.676)	(0.923)	(0.597)	(0.591)
BA or more	1.04	1.32	1.08	1.34	1.32
	(0.910)	(0.503)	(0.837)	(0.477)	(0.510)
Cognitive Skill		0.21***		0.21**	0.21**
		(0.010)		(0.013)	(0.014)
Extraversion		1.84		1.80	2.17
		(0.560)		(0.575)	(0.464)
Neuroticism		6.45**		6.04**	4.17*
		(0.012)		(0.016)	(0.072)
Agreeableness		1.63		1.59	1.25
		(0.536)		(0.555)	(0.781)
Conscientiousness		0.75		0.75	
		(0.711)		(0.709)	
Inhibitive Side of Consc.					3.54
					(0.155)
Proactive Side of Consc.					0.24*
					(0.066)
Delay Acceptance			0.80	0.91	0.89
			(0.478)	(0.811)	(0.752)
Risk Acceptance			0.83	0.69	0.71
			(0.657)	(0.427)	(0.458)
N	1065	859	1065	859	859

Table 14: **Determinants of Job Exits from the Company.** Job exits include all on-the-job failures, for any choice-based by firm or trainee, which applies only to those completing training.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	0.98	1.07	0.98	1.07	1.07
	(0.865)	(0.683)	(0.865)	(0.670)	(0.672)
African-American	1.48***	1.33*	1.47***	1.34*	1.31*
	(0.002)	(0.063)	(0.003)	(0.057)	(0.090)
Native American	0.64	0.63	0.64	0.63	0.65
	(0.123)	(0.165)	(0.123)	(0.164)	(0.196)
Asian	1.55	0.47	1.56	0.46	0.45
	(0.398)	(0.470)	(0.393)	(0.455)	(0.449)
Latino	1.59*	1.76*	1.59*	1.76*	1.77*
	(0.081)	(0.086)	(0.083)	(0.088)	(0.085)
Separated	1.91***	2.23***	1.90***	2.24***	2.34***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Divorced	0.86	0.83	0.86	0.83	0.82
	(0.263)	(0.199)	(0.264)	(0.199)	(0.190)
Never Married	0.97	1.03	0.97	1.03	1.03
	(0.766)	(0.830)	(0.775)	(0.843)	(0.829)
Age	0.97	0.95	0.97	0.95	0.95
	(0.357)	(0.143)	(0.351)	(0.142)	(0.134)
Age^2	1.00	1.00	1.00	1.00	1.00
	(0.411)	(0.116)	(0.401)	(0.119)	(0.112)
Some College	0.89	1.05	0.89	1.04	1.04
	(0.197)	(0.676)	(0.215)	(0.696)	(0.701)
BA or more	0.74*	0.90	0.74	0.90	0.90
	(0.088)	(0.618)	(0.101)	(0.591)	(0.589)
Cognitive Skill		0.41***		0.40***	0.40***
		(0.003)		(0.003)	(0.003)
Extraversion		0.81		0.81	0.85
		(0.648)		(0.660)	(0.724)
Neuroticism		1.00		0.99	0.95
		(0.995)		(0.983)	(0.901)
Agreeableness		0.65		0.65	0.63
		(0.219)		(0.212)	(0.188)
Conscientiousness		1.66		1.64	
		(0.211)		(0.219)	
Inhibitive Side of Consc.					1.56
					(0.273)
Proactive Side of Consc.					1.12
					(0.766)
Delay Acceptance			0.96	1.08	1.08
			(0.778)	(0.641)	(0.654)
Risk Acceptance			1.06	0.98	0.99
			(0.783)	(0.912)	(0.955)
N	951	767	951	767	767

Table 15: **Determinants of Discharges from the Company.** Discharges are Training Exits and Job Exits that were *involuntary*.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	0.93	0.96	0.93	0.98	0.98
	(0.780)	(0.905)	(0.785)	(0.945)	(0.945)
African-American	2.98***	2.23***	3.13***	2.42***	2.58***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Native American	0.89	0.99	0.88	0.99	0.93
	(0.800)	(0.981)	(0.783)	(0.989)	(0.887)
Asian	2.08	0.00	1.97	0.00	0.00
	(0.333)	(1.000)	(0.378)	(1.000)	(1.000)
Latino	1.20	1.23	1.23	1.14	1.14
	(0.753)	(0.781)	(0.731)	(0.855)	(0.857)
Separated	3.92***	4.42***	3.91***	4.42***	4.28***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Divorced	1.29	1.29	1.29	1.33	1.31
	(0.276)	(0.341)	(0.275)	(0.294)	(0.320)
Never Married	1.81***	2.11***	1.78***	2.04***	1.98***
	(0.005)	(0.003)	(0.007)	(0.004)	(0.007)
Age	1.03	1.01	1.03	1.01	1.00
	(0.505)	(0.791)	(0.519)	(0.895)	(0.944)
Age^2	1.00	1.00	1.00	1.00	1.00
	(0.918)	(0.788)	(0.906)	(0.738)	(0.698)
Some College	0.89	1.13	0.87	1.12	1.12
	(0.503)	(0.552)	(0.418)	(0.581)	(0.592)
BA or more	0.74	0.80	0.70	0.74	0.75
	(0.351)	(0.579)	(0.269)	(0.446)	(0.472)
Cognitive Skill		0.17***		0.13***	0.13***
		(0.001)		(0.000)	(0.000)
Extraversion		2.32		2.47	2.39
		(0.351)		(0.312)	(0.326)
Neuroticism		1.31		1.12	1.21
		(0.696)		(0.871)	(0.788)
Agreeableness		0.61		0.55	0.65
		(0.449)		(0.363)	(0.516)
Conscientiousness		1.57		1.38	
		(0.530)		(0.655)	
Inhibitive Side of Consc.					0.53
					(0.376)
Proactive Side of Consc.					1.77
					(0.415)
Delay Acceptance			1.44	2.07**	2.10**
			(0.186)	(0.025)	(0.022)
Risk Acceptance			0.75	0.59	0.58
			(0.417)	(0.175)	(0.155)
N	1065	859	1065	859	859

Table 16: **Determinants of Voluntary quits from the Company.** Voluntary Quits are Training Exits and Job Exits that were *voluntary*.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	1.08	1.16	1.08	1.15	1.16
	(0.612)	(0.364)	(0.615)	(0.391)	(0.370)
African-American	1.45***	1.38**	1.41**	1.35*	1.27
	(0.005)	(0.044)	(0.012)	(0.059)	(0.149)
Native American	0.61	0.58	0.61	0.58	0.63
	(0.110)	(0.133)	(0.115)	(0.133)	(0.210)
Asian	1.61	1.94	1.64	1.97	1.92
	(0.356)	(0.288)	(0.335)	(0.271)	(0.286)
Latino	1.65*	1.93**	1.62*	1.93**	1.94**
	(0.068)	(0.047)	(0.079)	(0.046)	(0.044)
Separated	1.22	1.24	1.19	1.23	1.33
	(0.414)	(0.477)	(0.474)	(0.494)	(0.347)
Divorced	0.81	0.75*	0.81	0.75*	0.76*
	(0.118)	(0.063)	(0.126)	(0.064)	(0.068)
Never Married	0.89	0.91	0.90	0.92	0.92
	(0.346)	(0.495)	(0.379)	(0.525)	(0.568)
Age	0.97	0.95	0.97	0.95	0.95
	(0.387)	(0.165)	(0.372)	(0.162)	(0.143)
Age^2	1.00	1.00	1.00	1.00	1.00*
	(0.401)	(0.119)	(0.368)	(0.111)	(0.096)
Some College	0.90	1.03	0.92	1.04	1.03
	(0.263)	(0.802)	(0.354)	(0.764)	(0.819)
BA or more	0.80	1.02	0.83	1.03	1.02
	(0.216)	(0.941)	(0.321)	(0.870)	(0.920)
Cognitive Skill		0.45**		0.48**	0.48**
		(0.011)		(0.021)	(0.022)
Extraversion		0.69		0.68	0.75
		(0.441)		(0.427)	(0.568)
Neuroticism		1.43		1.46	1.24
		(0.337)		(0.309)	(0.585)
Agreeableness		0.80		0.82	0.72
		(0.547)		(0.587)	(0.390)
Conscientiousness		1.40		1.43	
		(0.413)		(0.388)	
Inhibitive Side of Consc.					2.55**
					(0.028)
Proactive Side of Consc.					0.65
					(0.275)
Delay Acceptance			0.79	0.84	0.83
			(0.129)	(0.325)	(0.276)
Risk Acceptance			1.14	1.05	1.09
			(0.531)	(0.816)	(0.721)
N	1065	859	1065	859	859

Table 17: **Determinants of Accident Risk with Exposure Adjustment.**

	M1wb HR/(pval)	M2wb HR/(pval)	M3wb HR/(pval)	M4wb HR/(pval)	M5wb HR/(pval)
Female	1.227	1.183	1.226	1.184	1.169
	(0.192)	(0.315)	(0.194)	(0.315)	(0.340)
African American	1.167	1.203	1.171	1.218	1.292*
	(0.309)	(0.220)	(0.302)	(0.193)	(0.098)
Native American	1.343	1.783**	1.337	1.797**	1.723**
	(0.300)	(0.011)	(0.312)	(0.012)	(0.023)
Asian	1.028	1.791	1.019	1.775	1.828
	(0.969)	(0.391)	(0.979)	(0.400)	(0.405)
Latino	1.398	1.544	1.402	1.549	1.548
	(0.440)	(0.298)	(0.434)	(0.291)	(0.289)
Separated	0.683	0.550*	0.684	0.553*	0.520*
	(0.313)	(0.097)	(0.313)	(0.100)	(0.073)
Divorced	1.028	0.989	1.026	0.987	0.992
	(0.828)	(0.932)	(0.842)	(0.921)	(0.951)
Never Married	1.548***	1.498***	1.547***	1.494***	1.494***
	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Age	0.985	0.982	0.985	0.983	0.982
	(0.647)	(0.599)	(0.641)	(0.618)	(0.598)
Age^2	1.000	1.000	1.000	1.000	1.000
	(0.320)	(0.297)	(0.317)	(0.316)	(0.300)
Some College	1.154	1.117	1.152	1.113	1.108
	(0.170)	(0.325)	(0.177)	(0.340)	(0.362)
BA or more	1.212	1.200	1.207	1.184	1.183
	(0.217)	(0.257)	(0.229)	(0.300)	(0.306)
Cognitive Skill Index		1.017		1.009	1.007
		(0.815)		(0.911)	(0.922)
Extraversion		1.217		1.231	1.118
		(0.561)		(0.540)	(0.739)
Neuroticism		0.740		0.730	0.808
		(0.353)		(0.334)	(0.536)
Conscientiousness		0.474**		0.476**	
		(0.032)		(0.033)	
Agreeableness		1.053		1.031	1.147
		(0.880)		(0.930)	(0.688)
Delay Acceptance			1.030	1.094	1.110
			(0.841)	(0.562)	(0.500)
Risk Acceptance			1.026	0.949	0.920
			(0.908)	(0.818)	(0.707)
Consc-Inhibitive					0.394***
					(0.008)
Consc-Proactive					1.021
					(0.954)
Obs Weeks	42470	40437	42470	40437	40437
Subjects	949	900	949	900	900
Chisq	178	182	181	182	188
df	46	51	48	53	54

Table 18: **Determinants of log of Body Mass Index.** The dependent variable is the log of BMI. The coefficients reported are standardized (β) coefficients.

	(1)	(2)	(3)	(4)	(5)
	beta/p	beta/p	beta/p	beta/p	beta/p
Female	0.08**	0.09**	0.08**	0.09***	0.09**
	(0.027)	(0.011)	(0.026)	(0.010)	(0.011)
African-American	–0.03	–0.01	–0.02	0.00	–0.01
	(0.344)	(0.849)	(0.547)	(0.994)	(0.698)
Native American	0.02	0.02	0.02	0.02	0.02
	(0.562)	(0.634)	(0.508)	(0.579)	(0.514)
Latino	0.05	0.05	0.05	0.05	0.04
	(0.144)	(0.147)	(0.156)	(0.160)	(0.207)
Separated	–0.04	–0.03	–0.04	–0.03	–0.03
	(0.266)	(0.371)	(0.300)	(0.405)	(0.473)
Divorced	–0.06	–0.06	–0.06	–0.06	–0.05
	(0.125)	(0.107)	(0.125)	(0.112)	(0.164)
Never Married	0.02	0.01	0.02	0.00	0.01
	(0.602)	(0.896)	(0.634)	(0.929)	(0.891)
Age	0.19***	0.21***	0.18**	0.20***	0.19***
	(0.008)	(0.005)	(0.010)	(0.007)	(0.008)
Age^2	–0.24***	–0.26***	–0.25***	–0.27***	–0.26***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Some College	0.03	0.02	0.02	0.01	0.00
	(0.415)	(0.697)	(0.555)	(0.771)	(0.899)
BA or more	0.01	0.01	–0.00	0.00	–0.00
	(0.783)	(0.739)	(0.938)	(0.917)	(0.969)
Cognitive Skill		0.01		–0.00	–0.00
		(0.767)		(0.909)	(0.906)
Extraversion		0.08**		0.08**	0.08**
		(0.044)		(0.045)	(0.036)
Neuroticism		0.00		–0.00	–0.04
		(0.918)		(0.972)	(0.391)
Agreeableness		0.01		0.00	–0.01
		(0.828)		(0.941)	(0.729)
Conscientiousness		–0.15***		–0.16***	
		(0.000)		(0.000)	
Inhibitive Side of Consc.					0.03
					(0.436)
Proactive Side of Consc.					–0.21***
					(0.000)
Delay Acceptance			0.07**	0.07*	0.07*
			(0.040)	(0.050)	(0.074)
Risk Acceptance			–0.04	–0.04	–0.03
			(0.292)	(0.286)	(0.342)
r2	0.035	0.057	0.040	0.063	0.074
N	840	810	840	810	810

Table 19: **Determinants of smoking habit.** Logit regressions of the variable equal to one if the subject is a smoker. Marginal effects at the mean of the dependent variables.

	(1)	(2)	(3)	(4)	(5)
	b/p	b/p	b/p	b/p	b/p
Female	0.01	0.04	0.01	0.03	0.03
	(0.813)	(0.534)	(0.846)	(0.683)	(0.686)
African-American	–0.06	–0.04	–0.10*	–0.07	–0.05
	(0.327)	(0.504)	(0.073)	(0.281)	(0.460)
Native American	0.05	0.02	0.03	–0.01	–0.03
	(0.699)	(0.911)	(0.826)	(0.925)	(0.801)
Latino	–0.12	–0.05	–0.12	–0.06	–0.05
	(0.293)	(0.695)	(0.269)	(0.657)	(0.707)
Separated	0.26***	0.20*	0.26***	0.21**	0.19*
	(0.008)	(0.072)	(0.006)	(0.050)	(0.091)
Divorced	0.15***	0.12**	0.16***	0.12**	0.12**
	(0.008)	(0.048)	(0.004)	(0.034)	(0.039)
Never Married	0.07	0.04	0.08*	0.05	0.05
	(0.133)	(0.487)	(0.080)	(0.368)	(0.371)
Age	0.00	0.01	0.00	0.01*	0.01*
	(0.319)	(0.128)	(0.296)	(0.096)	(0.080)
Age^2	–0.00**	–0.00**	–0.00*	–0.00**	–0.00**
	(0.030)	(0.014)	(0.052)	(0.018)	(0.013)
Some College	–0.11***	–0.11**	–0.10**	–0.10**	–0.10**
	(0.003)	(0.016)	(0.010)	(0.027)	(0.031)
BA or more	–0.26***	–0.22***	–0.22***	–0.18**	–0.17**
	(0.000)	(0.002)	(0.001)	(0.017)	(0.027)
Cognitive Skill		–0.13		–0.04	–0.04
		(0.292)		(0.744)	(0.733)
Extraversion		–0.11		–0.18	–0.24
		(0.567)		(0.359)	(0.224)
Neuroticism		–0.09		–0.04	–0.01
		(0.557)		(0.803)	(0.921)
Agreeableness		–0.29**		–0.26*	–0.21
		(0.036)		(0.060)	(0.136)
Conscientiousness		–0.24		–0.18	
		(0.141)		(0.269)	
Inhibitive Side of Consc.					–0.36**
					(0.026)
Proactive Side of Consc.					0.04
					(0.807)
Delay Acceptance			–0.27***	–0.28***	–0.27***
			(0.000)	(0.000)	(0.000)
Risk Acceptance			0.16**	0.23**	0.21**
			(0.048)	(0.012)	(0.021)
N	654	549	654	549	549