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Determinants of Food Consumption Choices: Experimental Evidence from St. Kitts[*]

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Abstract

In this paper, we use economics experiment laboratory intruments to measure time, risk and ambiguity preferences, which we correlate with food choice factors (items that influence food choice) and actual food consumption measures. We find that present bias, and to a lesser extent risk preferences, are significantly correlated with the food choice factors of health, natural content, and weight control. We find these correlations to be less consistent with actual reported food chocies. This finding indicates a discrepancy between what individuals ideally would like to eat and what they actually consume. This finding suggests scope for intervention to bring the two into alignment.

Keywords: Field Experiment.

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1 Introduction

In this paper we examine the determinants of food consumption choices with particular interest in the role of time preferences and attitudes towards uncertainty. We use incentivized behavioral instruments to elicit time, risk and ambiguity preferences which we combine with survey data on food consumption frequency and food choice factors. We conduct our experiments in a field laboratory, with a subject pool consisting of caregivers, within a larger study of food security in the Caribbean Community of St. Kitts.

We find that present bias and risk aversion are a significant predictors of the factors self-reported as important for choice of foods. Surprisingly, none of the parameters consistently predict self-reported actual consumption frequencies. This suggests a discrepancy between what individuals find important in deciding what to consume and what they actually consume. It is possible that individuals consider their rational selves when relating the important attributes for the food they eat, but reveal their true selves in their actual choices. This possibility suggests a role for interventions aimed at aligning those two selves.

Health outcomes are affected by many factors, including nutrition choices and exercise, among many others. Healthy eating and increased physical activity are both associated with lower rates of chronic diseases and a lower likelihood of being overweight or obese. While socio-economic characteristics such as education and income have a large part to play, behavioral determinants such as time preferences and attitudes towards risk and uncertainty can be important factors affecting individual choices and subsequent outcomes.

In particular, individuals who exhibit present bias and/or have high discount rates (i.e., relatively lower concern for the future) may be less likely to invest in activities which have little short-term benefits (and possible short-term costs), but which are conducive to long-term health. Additionally, individuals with higher appetite for risk may indulge in activities which pose greater risk to health such as smoking and excessive drinking. Individuals averse to ambiguity may avoid risks that have not been well quantified.

Many studies have considered the role of risk and time preference on health outcomes

such as body mass index and on choices such as smoking, alcohol consumption, exercise and seat-belt use (Khwaja, et al., 2006; Anderson and Mellor, 2008; Chabris et al., 2008; Bradford et al., 2014) but few have looked specifically at nutrition choices, arguably one of the most important contributors to overall health.

Our study fills a gap with an artefactual experiment with a subject pool for whom nutrition choices are particularly important. We contribute to the literature in a two ways. First, we focus on the link between food consumption choice, i.e., a health investment choice, and factors motivating the choice. This has not been widely studied in the literature. Second, to explore the determinants of the choice we elicit time, risk and ambiguity preferences, which has only been done by Sutter et al. (2013) for children. Our findings suggest that it is important to consider motivations for the choice of different foods in addition to the actual consumption.

The next section provides empirical and theoretical background for our study, followed by the experimental design and procedures, results, and conclusion.

2 Determinants of health choices and outcomes

Decisions about health and consumption involve tradeoffs between costs and benefits occuring at different points in time. For example, forgoing fast food today may involve an immediate utility cost, however, there may be utility benefits in the future through better health outcomes. Individual preferences over the timing of receiving utility influence any such choice with intertemporal costs and benefits.[1] High rates of time preference indicate that an individual places more weight on the present while discounting the future more heavily.

It is important to control for risk preferences when estimating discount rates; Andersen et al. (2008) jointly elicited risk and time preference for adults in Denmark and found

[1]Frederick et al. (2002) define time preference as "the preference for immediate utility over delayed utility".

that subjects are generally risk averse, and that discount rates estimated through joint elicitation were lower than those found in previous studies. Risk and ambiguity preferences could also be fundamentally at work influencing choices about health and consumption; risk preferences are known to be correlated with risky behaviors leading to poor health outcomes, and ambiguity preferences can be involved when the properties of the riskiness of choices are not well defined, e.g., with genetically modified food.

2.1 Time preferences

A number of studies have examined the relationship between the attitude towards time and various health investment decisions, health outcomes (e.g., body mass index), and self-reported health and associated choices (e.g., smoking, exercise and food choice). Time preferences are typically measured in one of two ways. First, some studies use proxy variables assumed to be closely related to time preferences and correlate them with health variables. Komlos et al. (2004) performed a time series analysis and found that the aggregate trend in consumer debt (where higher trend was assumed to be suggestive of a high discount rate) correlated with rising obesity. They also found that countries with lower savings rates have higher rates of obesity.

Using individual date from the National Longitudinal Survey of Youth (NLSY), Smith et al. (2005) found a relationship between the change in individual saving rates and body mass index (BMI). Zhang and Rashad (2011) found that both self-reported lack of willpower and desire and no effort to lose weight are associated with higher BMI for some populations. Borghans and Golsteyn (2006) used a number of different proxies (savings behavior, attitude towards the future, spending, planning) and find connections between time preferences and BMI, however the strength of the relationship depended on the proxy. Links have also been found between time preferences and other health investment behaviors like disease screening (Bradford et al., 2010), general health maintenance practices (Bradford, 2010), and behavior to avoid hypertension (Axon et al., 2009).

A second way to measure time preferences is to use individuals' responses to questions involving intertemporal choices either with hypothetical responses in surveys or incentivized choices in lab experiments. Questions typically involve a choice between receiving a payment at a point in time or receiving a delayed, often larger payment. Individual discount rates can be estimated based on the respondent choices. Fuchs (1982) was the first to associate these elicited preferences to health behaviors finding that more future-oriented individuals were more likely to exercise and seek preventative healthcare and less likely to smoke and eat unhealthy foods; all behaviors associated with better long-term health. Harrison et al. (2010) found a relationship between individual discount rates and smoking.

Chabris et al. (2008) examined the correlation between several health-related behaviors and individual discount rates and found that a higher discount rate is associated with a higher BMI, increased likelihood of smoking and drinking, and lower likelihood of exercising. Weller et al. (2008) find that obese women have higher discount rates than non-obese women. Ikeda et al. (2010) estimate the link between hyperbolic discounting and body weight and find that BMI is related to both impatience and inclination towards procrastination. Seeyave et al. (2009) found a connection between time preferences at age four and being overweight at age 11 for US children. Bradford et al. (2014) considered the possibility of time-inconsistent preferences with a quasi-hyperbolic specification and found that the inferred discount factor was significantly related to snacking, cigarette smoking and binge drinking, while present bias was only to related smoking and drinking.

We use a procedure to experimentally elicit both a present bias parameter and a time discounting factor using a laboratory instrument with real incentives and real delayed payments. We use these two parameters to investigate the extent to which they determine factors for food choices and the choices themselves.

2.2 Risk and ambiguity preferences

A related literature examines the connection between risk preference and health habits and outcomes. For any decision involving an investment, attitudes towards risk are also important. Additionally, the effect of attitudes towards ambiguity, separate from risk is the focus of an emerging literature in other fields (e.g., Bossaerts et al. (2010); Engle-Warnick et al. (2011)).

Anderson and Mellor (2008) pair risk preference data elicited using the Holt and Laury (2002) lottery choice task with survey data on health-related behavior. They found that risk aversion is negatively associated with cigarette smoking, drinking and being overweight or obese. Lusk and Coble (2005) studied the willingness of individuals to consume genetically modified foods and found a negative relationship with experimentally elicited risk aversion. Dohmen et al. (2010) find that self-assessed willingness to take risk in the health domain in general predicted smoker status but other risk attitudes (including measured from a hypothetical lottery choice task) were uncorrelated.

Galizzi and Miraldo (2012) estimated risk preferences from the Holt and Laury task using maximum likelihood methods and found that individuals with higher BMI tend to be more risk-loving, however, this link was not robust when controlling for a healthy eating index. Consistent with this finding they also found that individuals with healthier eating habits tended to be more risk averse. Sutter et al. (2013) investigated the link between time, risk *and* ambiguity preferences, where risk refers to known probabilities and ambiguity refers to unknown probabilities (Ellsberg 1961; Halevy 2007). They found significant association between time preference and smoking, drinking and BMI for children in Austria. However, risk and ambiguity preferences were weak predcitors of behavior, with risk-averse subjects having lower BMI and more ambiguity averse subjects being less likely to smoke. One can argue that it is ambiguity rather than risk that matters for health decisions, since the potential outcomes are unknown and information about costs and benefits and the impact of choices are often vague and changing.

We use a procedure to experimentally elicit both both risk and ambiguity prefernces using a laboratory instrument with real incentives. We use these two measures, as with the time preferences, to investigate the extent to which they determine factors for food choices and the choices themselves.

2.3 Summary

Overall, this literature has reported findings regarding some effects of attitudes towards time, risk, and ambiguity on health outcomes and health-related choices These findings have been mixed, not always consistent, and there is room for greater consideration of the possibility of non-constant discounting.

3 Measuring food consumption

In this section we turn our attention to the measurement of food consumption. There are a number of ways to measure individual food intake (Johnson 2002). Traditional methods rely on information provided by the subjects themselves, e.g., food records, food frequency-questionnaires (FFQs), and 24-hour recalls. Food records are diaries in which individuals record all consumption of food items over a three to seven day period. FFQs, first developed by Wiehl and Reed (1960), list specific foods and asks the subjects if they eat them, how often and in some cases, the quantity. FFQs can be modified based on the population under study, and can also be used to screen for intake of specific food groups, for instance, fruits and vegetables (Trainor et al., 2006).

The 24-hour recall collects detailed information on foods and portions consumed over the previous 24 hours and allows quantitative assessment of nutrient intake. Each of these measures has its advantages and disadvantages. While a 24-hour recall can provide comprehensive data on consumption, a single day's food intake may not be representative of an overall diet. Food records can place a high burden on individuals and tend to decline in

quality the longer the recorded period, while FFQs can suffer from recall error. An alternative to these measures is chemical analysis of diets in which subjects provide duplicates of all foods consumed, which is then analysed for nutrient content. Use of this method is limited due to high costs and inconvenience.

In this paper we utilise a 30-item FFQ to measure average food consumption. We also administer a food choice questionnaire (FCQ) first developed by Steptoe et al. (1995) to measure the multidimensional motives underlying people's selection of food. It consists of 36 questions which solicit in a systematic way a number of health and non-health related motives of food choice. FCQs have been utilised in many different countries, such as United Kingdom (Steptoe et al., 1995), Finland and the Netherlands (Lindeman and Vaananen, 2000) and Uruguay (Ares and Gambaro, 2007) among others. Januszewska et al. (2011) found that the factor structure of the FCQ is invariant across different populations, suggesting its usefulness to measure factors influencing food choice in our context.

4 Experimental Design

Our experiment consists of two main components: (1) incentivised elicitation of time, risk and ambiguity preferences, and (2) data on food consumption choices collected by the FFQ and FCQ. Following this is a short exit survey to measure socio-economic characteristics and demographics.

4.1 Time Preference Measure

We elicit individual attitude towards delay (impatience) using two multiple price lists (MPL), depicted in Figures 1 and 2).[2] Each list contains twenty binary choice questions, where the alternatives are sure payoffs at two different points in time. Participants are asked whether they prefer a smaller, earlier payoff to a later and in most cases larger payoff. The early payoff

[2]The instrument closely follows that used in Sutter et al. (2013).

remains fixed while the later payoff increases along the list starting with the earlier payoff. The payoffs and the time delay (three weeks) are identical in both MPLs; the earlier payment is EC $26.00 and the amount for the later payoff increases monotonically by increments of EC $0.50 from EC $26.00 to EC $35.50[3].

The point at which an individual switches from choosing the earlier payment to choosing the payment three weeks in the future is an indication of impatience: the further down the list the switch occurs the more impatient the individual. Switching indicates that the participant is indifferent at some point in the interval between the last row before switching and the switching row. This allows us to construct a range of values for the discount factor based on the observed choice. In Figure 1, each choice is between a payoff today and a payoff in three weeks, while in Figure 2, there is an upfront delay of three weeks. Thus each choice is between a payoff in three weeks and a payoff in six weeks. This allows us to consider constant discounting and quasi-hyperbolic discounting.

4.2 Risk and Ambiguity Preference Measures

We elicit attitude towards risk using a measure based on the well-known instruments of Binswanger (1980) and Eckel and Grossman (2003). Figure 3 presents our instrument. It consist of twelve binary lottery choices. Each lottery has two possible outcomes, which occur with equal probability, with the expected value and the variance of the right-hand side gamble increasing as one goes down the list. The first row represents a choice between the left gamble of EC $26 for sure and the right gamble of a 50-50 chance of either EC $24 or EC $29; the last row represents a choice between the left gamble of a 50-50 chance of either EC $4 or EC $59 and right gamble of a 50-50 chance of either EC $2 or EC $62.[4]

Both the expected value and the variance of the right-hand side gamble increase as one goes down the rows in such a way that a utility maximiser will reveal her preference by

[3]The exchange rate at the time of the experiment was US $1 = EC $2.70

[4]This is a similar format to the Holt and Laury (2002) instrument, which is also used to measure risk in experiments. Like here, subjects are presented a sequence of binary choices in table form however in their lotteries, the outcomes are held constant but their probabilities vary from decision to decision.

switching from the right-hand side gamble to the left-hand side gamble at some point. Thus we theoretically obtain an interval estimate of a risk preference parameter depending on the switching point. In each row, choosing the left gamble means an individual is choosing the relatively safer gamble. This allows us to measure attitudes towards risk simply as the number of left choices for an individual. The higher the number of safe choices the higher the level of risk aversion[5].

Our related ambiguity preference measure, shown in Figure 4, presents the participants with thirteen binary choices between a lottery with unknown probabilities and a lottery with the same outcomes but with known 50-50 probabilities. This instrument and the following ambiguity follow closely those utilized in Engle-Warnick and Laszlo (2013). Each binary choice corresponds to one of the lotteries on the risk instrument along with its ambiguous counterpart. Choosing the lottery with the known probability distribution over outcomes carries a small cost (EC $1), i.e., the subject's earnings are reduced by EC $1 if she chooses a left lottery while the right lottery costs nothing to select.

Thus the decision problem for the participant is whether or not to pay a small cost to eliminate ambiguity, where ambiguity is uncertainty regarding the probability distribution over outcomes. This allows us to measure attitudes towards ambiguity simply as the number of left choices which would correspond to level of ambiguity aversion.[6]

4.3 Food Frequency and Food Choice Questionnaires

Once the experimental tasks were complete, the participants completed a food frequency questionnaire (Appendix A) and a food choice questionnaire (Appendix B). The FFQ contained a thirty-item checklist of foods and beverages: dairy food; fruits and vegatables; fish and seafood; legumes; meats and eggs; breads, cereals and pasta; and other foods e.g. fast foods and soda. For each food item they indicated how often it is consumed - times per day,

[5]For robustness, we also estimate an interval parameter for risk preference based on the number of safe choices and the associated implied switch point from the safer to the riskier lottery.

[6]Ambiguity preference ranking (which incorporated risk preferences) were also estimated and used in robustness tests.

week or month.

The FCQ contained a thirty-six item checklist of factors and participants indicated how importact each factor was for the food they consume e.g. ease of preparation, nutritious, taste. Each of the thirty-six items can be further categorised into nine factors - health, moods, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern.

5 Experimental Procedures

5.1 Setting

We ran our study in St. Kitts in August 2013. The experiment was part of a larger project on food security in the Caribbean Community (CARICOM) funded by Canada's International Development Research Centre (IDRC) and the Department of Foreign Affairs and International Trade (DFAIT) through the Canadian International Food Security Research Fund (CIFSRF). St. Kitts was one of the countries chosen to implement a farm-to-fork approach which integrated nutrition interventions at both the production level and consumption level. At the consumer level, the intervention involved modification of the meals in the school feeding program. In preparation for this intervention, a consumer health and nutrition household survey (CHNHS) was conducted with the parents and caregivers of children from the primary schools involved in the project. The respondents of this survey provided the sampling frame for participant recruitment for our study.

5.2 Subject Pool

One-hundred sixteen parents or main caregivers of primary school aged children were recruited to participate in our study. Recruitment of participants and organization of the location for the experiment were conducted by local field staff. Recruiting was done over the phone: individuals were called a week prior to the sessions and invited to participate in the

activity from a prepared script. Individuals who agreed to participate were called again on the day of the sessions as a reminder and to confirm their attendance. In the end, a total of eighty-five individuals participated in the sessions. Ten sessions were held from August 7^{th} to August 13^{th} 2013, with sessions sizes ranging from two to eighteen individuals. Each session was approximately 2 - 2 1/2 hrs long. Participants were compensated in cash.

5.3 Experimental Sessions

The sessions were run as laboratory experiments in the field. Each subject was given a show-up fee of EC $20 to cover transportation and opportunity costs. This was paid immediately to facilitate trust in the incentivized part of the experiment. The remainder of compensation, an average EC $31.50, was based on the results of subjects' decisions in the incentivized part of the session. After obtaining verbal consent, the instructions were read from a script by a single experimenter. The subjects completed the time instruments first (labeled Task 1 and Task 2), followed by the risk instrument (Task 3) and finally the ambiguity instrument (Task 4). Upon completion of the behavioral instruments, subjects filled out food frequency questionnaires, food choice questionnaires and a socio-demographic survey.

5.4 Payment Procedure

Each subject was paid for one randomly selected decision from all tasks. To determine which decision was chosen for payment, the subjects first randomly chose a task (out of 4) they would be paid for, and then they randomly chose which decision from that task they would be paid for. For this we used six separate bags. The first bag contained four numbered chips and determined which task would be selected for payment. We broke the randomness down by task rather than numbering decisions across tasks for ease of understanding for the subjects.

The second bag contained twenty numbered chips, which determined which decision would be selected for payment if the subject chose a time instrument (Task 1 or 2). The

third contained twelve numbered chips which determined which decision would be selected for payment if the subject chose the risk instrument (Task 3). The fourth contained thirteen numbered chips which determined which decision would be selected for payment if the subject chose the ambiguity instrument (Task 4). The fifth bag contained five blue chips and five yellow chips and determined the outcome of a 50-50 gamble with known probabilities (Task 3 or the left-hand side gamble for Task 4). The sixth bag contained a number of blue and yellow chips which we determined randomly by drawing from a uniform distribution from all possible combinations of yellow and blue chips (the right-hand side gamble for Task 4). If either Task 3 or 4 was chosen for payment, the subjects were first asked which color they chose, blue or yellow to represent the higher of the two payoffs. They then pulled a chip from the appropriate to bag determine their earnings.

There are always concerns in time preference experiments about how to implement real payoffs over different points in time. The problem is that there can transaction costs involved on the part of both the researcher and the participant as well participant uncertainty about receiving payoffs in the future. To mitigate these concerns all incentivized earnings were paid using dated checks. This standardised the transaction costs across participants and allowed for time, risk and ambiguity decisions to be paid using the same format. In addition to the upfront show-up fee, trust between the subjects and the experimenters was facilitated by the fact that the participants had previously consented to the larger food security project, easing uncertainty about the validity of the promise of future payments.

6 Description of Data

The data set consists of a rich and complex set of behavioral and survey instruments. For this reason, for clarity we include the following section dedicated to describing the data.

6.1 Construction of Variables

Time preference

Samuelson's discounted utility (DU) model (1937) proposed a theoretical framework in which a single parameter, the rate of time preference ρ, captures all the motives for intertemporal tradeoffs. Individuals choose a consumption path (c_0,...,c_T) to maximize the sum of current and future utility:

$$U(x_0, ..., x_T) = \sum_{t=0}^{T} \delta(t) U(x_t),$$

where $\delta(t) = (\frac{1}{1+\rho})^t$ is the individual's discount factor and ρ is the pure rate of time preference or discount rate. This specification assumes constant and independent discounting and implies time consistent preferences, i.e., delaying outcomes by a common amount at any point in time should not change individual preference between the outcomes.

The assumption of time consistent preferences has been challenged empirically as discount rates are not observed to be constant over time, rather, they appear to decline (hyperbolic discounting). Laibson (1997) considers a special case referred to as quasi-hyperbolic discounting where the utility function takes the form:

$$U(x_0, ..., x_T) = u_0(x_0) + \beta \sum_{t=1}^{T} \delta^t U(x_t).$$

In this specification, the individual places disproportionately higher weight on the present outcomes relative to all future outcomes. The parameter β captures a time-inconsistent preference for current consumption referred to as present bias ($\beta < 1$), while δ captures the time-consistent (sometime referred to as long-run) component of preferences.

Recall that individuals made choices in two time frames (with and without an upfront delay) between a smaller, earlier payoff and (in most cases) a larger payoff 3 weeks later. Information from both price lists allows us to measure discount factors (δ) and to measure present (and future) bias (β).

To measure discount factors from the choice data, we first calculate the future equivalent of the fixed earlier payoff as the midpoint of the two later payoffs where a participant switches from the earlier to the later payoff. If the subject always chooses the later payoff, we use the amount of the earlier payoff (EC \$26) as the future equivalent. If the participant always chooses the earlier payoff, we use the maximum later payoff (EC \$35.5) as the future equivalent. This would be a lower bound for those individuals. We assume that $X \approx \delta^d \times FE$, where d is the delay length, X is the early payoff and FE is the future equivalent. In our instruments d, is three weeks so we calculate a 3-week discount factor $\delta = X/FE$.

For instance, if an individual prefers \$26 today over \$30 in 3 weeks, but prefers \$30.50 in 3 weeks to \$26 today, then the future equivalent is \$30.25 and we calculate the 3-week discount factor according to $(26/30.25)^{1/1} = 0.8595$. We use the responses to the two lists to calculate two discount factors $\delta_{0,3}$, $\delta_{3,6}$.

Using the two time frames allows us to identify any time inconsistency. For constant discounting, $\delta_{0,3}$, $\delta_{3,6}$ should be the same. If they are not, then respondents would indicate a bias towards the present ($\delta_{0,3} < \delta_{3,6}$) or the future ($\delta_{0,3} > \delta_{3,6}$). In our main analysis we impose a quasi-hyperbolic discounting structure and use $\delta = \delta_{3,6}$ as the long run discount factor and the ratio $\beta = \delta_{0,1}/\delta_{3,6}$ as the present bias discount factor which measures of the intensity of present bias.

Risk and ambiguity preferences

We infer risk preferences from decisions in the lottery choice tasks using standard utility theory. Risk is characterized by a probability distribution over payoffs and risk preferences are characterised by a standard utility function over outcomes. The lotteries in the instruments were each comprised of a high and a low outcome, x_l and x_h which occur with equal probability. Subjects chose between the left and right lottery (superscripts L and R below).

A participant choses the left (relatively safer) lottery if

$$\frac{1}{2}u(x_l^L) + \frac{1}{2}u(x_h^L) > \frac{1}{2}u(x_l^R) + \frac{1}{2}u(x_h^R). \tag{1}$$

While we can use this equation combined with a functional form for the utility function to compute an interval estimate of the risk parameter, we chose to use a simple count of the number of times participants chose the relatively safe gamble (i.e the number of safe choices made by the subject), which is the statistic reported in Holt and Laury (2002).[7] Similarly, we infer ambiguity preferences from decisions in the lottery tasks by counting the number of times the individual paid to avoid the ambiguous lottery[8]. Placing both measures in a regression appropriately and necessarily considers the marginal effect of each preference conditional on the other.

Food choice factors and food consumption

The thirty-six items of the food choice questionairre (FCQ) were answered on a bipolar 5-point likert type importance scale with points as follows: 1 ="very unimportant", 2 ="unimportant", 3 ="neither important or unimportant", 4 ="important" and 5 ="very important". We computed the scores on each of the nine dimensions by averaging item

[7]We present this count rather than estimated parameters from a utility function, because estimating the corresponding ambiguity parameter would involve thirteen parameters for each of the twelve risk parameters i.e. 132 parameters.

[8]Technically ambiguity preferences can only be accurately measured conditional on risk preferences. To account for risk we use the "Smooth Model of Decision Making Under Ambiguity" in Klibanoff, et al. (2005) to infer ambiguity preferences. In this model ambiguity is characterized by uncertainty about the probability of outcomes. Ambiguity preferences are characterised by two components: (1) a prior over the probability distribution of outcomes and (2) a subjective utility function V that operates over the lotteries. Assuming a uniform prior over the distribution of outcomes, there could be from zero to ten chips representing the higher of the two outcomes. The individual chooses to pay to avoid ambiguity if the subjective utility of the risky but costly lottery is less than that of the costless ambiguous one i.e.

$$V\big(\frac{1}{2}u(x_l^L - 1) + \frac{1}{2}u(x_h^L - 1)\big) < \frac{1}{11}\sum_{i=0}^{10} V\big(\frac{i}{10}u(x_l^R) + \frac{10-i}{10}u(x_h^R)\big)$$

See Engle-Warnick and Laszlo (2011) for more details on the computation of these risk and ambiguity parameter rankings. We present this simple count rather than estimated parameter rankings from a subjective utility function for ease of exposition. For robustness, we estimate interval parameter ranking for both risk and ambiguity and the results do not change qualitatively.

ratings per dimension. We used the individuals scores on each dimension as the variables of interest.

The thirty food items of the food frequency questionairre (FFQ) were answered on a nine point scale with points assigned as follows: "never or less than 1 per month", "1-3 per month", "1 per week", "2-4 per week", "5-6 per week", "1 per day", "2-3 per day", "4-5 per day" and "6+ per day". For each item we converted the raw responses to a daily frequency of consumption, which ranges from 0 to 6. We also computed daily frequency of consumption for various food groups. For this paper, we focus on a few specific foods and food groups: fast foods, regular soda and fruits and vegetables.

We also constructed variables which utilise all the consumption information provided by participants using the concept of energy density. Energy density is the available dietary energy per unit weight, expressed in calories per 100 grams of food. It has been related to rising obesity (Drewnowski et al., 2004), rising energy costs (Drewnowski et al., 2005) and weight management (Ello-Martin et al., 2005). The U.S. Department of Agriculture suggests that a dietary pattern low in calorie density improves weight loss and weight management (USDA, 2010). As such, low energy density foods can be thought of as loosely indicative of healthier consumption pattern.

To incorporate energy density into our analysis, we first categorised each food item into an energy density group (high >225 cal/100g, medium 150–225 cal/100g and low <150cal/100g) and then computed the average frequency of consumption of the items in each group.[9] We used the average frequency of consumption of high, medium and low energy density foods as the variables of interest.

[9]To classify food items into energy density categories, we used data from the 24-hour recall conducted in the CIRFSRF Food Security Project.

6.2 Sample characteristics

Exit survey

The socio-economic characteristics of the participants are presented in Table 2. Our participants were primarily female (89%) and single (70%) with a mean age of 35.6. Almost three-quarters had received at least seconday education, with a further 21% having attained post-secondary education. Participants came from households with an average size of six individuals with three adults and three children. For an estimate of wealth we used ownership of an automobile and home ownership: 31% of individuals owned an automobile and 69% owned their dwelling in which they lived. In addition, we asked two questions on food availability and affordability in order to build an index of food security, which ranges from 0 to 2. Sixty-eight percent of our sample were classified as severely food insecure, 27% were moderately food insecure, while only 5% were classified as food secure.

We also asked participants to report their subjective beliefs about their general health level. Twelve percent reported being in excellent health, 39% in very good health, 29% in good health, 11% in fair health and 5% in poor health, while 4% of participants reported that they did not know their general level of health.

Preference Measures

Table 1 presents summary statistics for our time, risk and ambiguity preference measures. The 3-week discount factor averages 0.89 for Task 1 and 0.87 for Task 2 with the upfront delay. While this is somewhat low, it is consistent with monthly discount factors using MPLs in previous literature (Meier and Sprenger, 2012; Bradford et al., 2014). The mean value of β is 1.032, indicating that the average respondent is future biased. Twenty-six percent of the sample is classfied as present biased, thirty-eight percent exhibits no bias and thirty-seven percent exhibit future bias.[10]

[10]The percentage of future bias individuals is somewhat higher than found in previous literature. Meier and Sprenger (2012) find 9 percent of their sample future biased while Bradford et al., (2014) find 26 percent of their sample future biased. However when using a non-parametric time consistency check, Takeuchi (2011)

The average number of safe choices in the risk preference instrument is 5.62, and the average number of times paid to avoid ambiguity is 5.22. Among those individuals who paid to avoid ambiguity at least once, the average times paid is 6.93. This suggests that those subjects are ambiguity averse because their ambiguity switch point is lower than their risk switch point.

Figures 5 and 6 present histograms for the risk and ambiguity preference measures. For both measures there is heterogeneity in responses, with the risk measure having multiple modes and the ambiguity measure having a mode of never choosing to pay to avoid ambiguity respectively. The measures are uncorrelated ($r = -0.0001, p = 0.999$) suggesting that two distinct preferences are being measured.

7 Results

7.1 Determinants of food choice factors

We begin our analysis by investigating the link between our preference measures, in particular the discount factor and present bias, and the factors underlying the choice of foods. To do so, we estimate the following regression:

$$y_i = \alpha_0 + \alpha_1 \delta_{3,6;i} + \alpha_2 \beta_i + \alpha_{\mathbf{3}} \mathbf{X_i} + \epsilon_i \tag{2}$$

where i denotes the individual, y is the food choice factor, X_i is a set of control variables including the risk and ambiguity measures, α_1 and α_2 are the main parameters of interest and ϵ is the error term. The control variables are the number of safe lottery choices, the number of times paid to avoid ambiguity, age, gender, dummies for secondary and post secondary education, a dummy for married, household size, automobile and home ownership, dummies for food security classification and session dummies. Our outcomes are continuous variables

find that more respondents are future bias that are present bias.

so we use ordinary least squares (OLS) estimation with robust standard errors.[11]

Table 3 presents OLS coefficient estimates for equation 2. The β parameter is significant and posivitely correlated with the factors health, natural content, ethical concern, familiarity and weight control. This indicates that increasing β, i.e., reducing present bias, is associated with increased importance being placed on these factors in the choice of typical foods consumed. By contrast, the discount factor is only significantly correlated with the natural content factor, i.e., more patient individuals place more importance on the natural content of the foods they typically consume. This suggests that it is the time inconsistent component of discounting that influences the underlying motives for food choice not long run impatience.

The risk and ambiguity controls are significantly correlated with some factors. Increasing risk aversion is associated with increased importance placed on health, natural content, ethical concern and mood while increasing ambiguity aversion is associated with increased importance placed on health and natural content. Among the other control variables, individuals with post secondary education place more importance on the natural content of food and less importance on mood. Older individuals place more importance on health, natural content, mood and weight control, while women place more importance on sensory appeal and price.

Overall these results suggest that time preferences in general and present bias in particular are important determinants of underlying motives for the choice of typical foods to eat. Whether this relationship translates into the actual food choices made will be examined in the following subsection.

[11]The results are robust to using a tobit specification which controls for censored data at the lower and upper level.

7.2 Determinants of food consumption choices

We next examine to what extent food consumption choices are associated with time preferences by estimating the following regression equation:

$$f_i = \alpha_0 + \gamma_1 \delta_{3,6;i} + \gamma_2 \beta_i + \gamma_{\mathbf{3}} \mathbf{X_i} + \nu_i, \tag{3}$$

where i denotes the individual, f is the food consumption choice (the frequency of consumption of specific foods and food groups; and average frequency of consumption of foods in each energy density category), X_i is a set of control variables including the risk and ambiguity measures, γ_1 and γ_2 are the main parameters of interest, and ν is the error term. The other control variables are as before. Since our outcomes are continuous variables censored both from below and from above, we estimate tobit models with robust standard errors.[12]

Table 4 presents the tobit marginal effects for fast foods, soda, and fruits and vegetables. The results here are not as strong as those for the food choice factors. The β parameter is only significantly correlated with frequency of fruit and vegetable consumption. More future biased (less present biased) individuals consume fruits and vegetables more frequently, however the effect is only marginally significant at the ten percent level. Long run impatience also only marginally significantly affects soda consumption, with higher impatience associated with increased consumption of soda. Surprisingly, neither time preference parameter is associated with fast food consumption.

Thus more present biased individuals who place lower importance on health and the natural content in their meals do not correspondingly consume more fast foods, which typically have lower health benefits and nutrient content. Interestingly, ambiguity aversion is negatively associated with fast food consumption, suggesting that perhaps individuals are less informed about the health effects of fast foods and those who dislike this lack of information reduce their consumption to suit.

[12]Results are robust to alternate specifications.

We next consider the effects on broader measures of consumption: all the food items in the FFQ categorised by energy density. Table 5 presents the tobit marginal effects for average frequency of consumption by energy density category. Again the results are not as strong as those for the food choice factors. The β parameter is only marginally significantly related to average frequency of consumption of low energy density foods. Less present biased individuals consume more low energy dense foods on average. On the other hand, more impatient individuals consume more medium energy density food, but again the significance is only marginal.

Thus less present biased individuals who place more importance on health as a factor in their food choice correspondingly consume more low energy dense foods but not less high energy dense foods. The ambiguity preference measure is negatively associated with consumption of medium energy dense foods, which suggests that individuals who dislike unknowns are less likely to eat these foods for which information about health effects may be most ambiguous.

7.3 Discussion

Overall the results on food consumption are somewhat consistent with the findings on the food choice factors, however they are weaker and less consistent. This suggests that there is some discrepancy between the factors that individuals view as being important when thinking about consuming foods and the foods that they actually consume. This could be the case for several resaons. First, this difference is consistent with the Ruhm (2012) "dual decision" approach where choices reflect an interaction between two systems: a "deliberative system" which operates within standard economic models and an "affective" system what responds quickly to stimuli without thought of long run effects. Perhaps when carefully considering the factors that they find important for food consumption, the "rational" self is in control, however the actual foods that are consumed are dependent on multiple situational issues making the choices less consistent with what individuals would ideally want to consume. This

suggests that between intentions and actual consumption may be a link where individuals can be influenced possibly by well-intentioned nudging.

Another possible reason for the discrepancy may be that individuals are misapplying the factors they find important to the food they are choosing to consume. This would be indicative of inaccurate or misinformation about different food items. That we find ambiguity aversion a significant variable in some of our food consumption regressions supports this reasoning. In this case making information more available may be the best policy recommendation to improve consumption choices.

8 Conclusion

In this paper, we used incentivized behavioral intruments to measure time, risk and ambiguity preference which we then correlated with food choice factors and food consumption measures. We contributed to the literature on the effect of preferences and health habits and outcomes, where food consumption is widely studied.

We found that while present bias, and to a lesser extent risk preferences, are significantly correlated with the food choice factors of health, natural content and weight control, these are not always consistent with the link between preferences and actual reported food choices. This finding indicates a discrepancy between what individuals ideally would like to eat and what actually consume, suggesting scope for intervention to bring the two into alignment. Our results suggests that the need for more research into the link between motives for food choice and the food consumption choices themselves.

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9 Figures and Tables

Figure 1: Time Preference Instrument: Part 1

DATE: ____ **ID:** ____

TASK 1 – Decision sheet

For each row, tick (✓) the circle to indicate whether you prefer the amount today or the amount in 3 weeks

Row	amount today		OR		amount in 3 weeks
[1]	$ 26.00 today	◯	or	◯	$ 26.00 in 3 weeks
[2]	$ 26.00 today	◯	or	◯	$ 26.50 in 3 weeks
[3]	$ 26.00 today	◯	or	◯	$ 27.00 in 3 weeks
[4]	$ 26.00 today	◯	or	◯	$ 27.50 in 3 weeks
[5]	$ 26.00 today	◯	or	◯	$ 28.00 in 3 weeks
[6]	$ 26.00 today	◯	or	◯	$ 28.50 in 3 weeks
[7]	$ 26.00 today	◯	or	◯	$ 29.00 in 3 weeks
[8]	$ 26.00 today	◯	or	◯	$ 29.50 in 3 weeks
[9]	$ 26.00 today	◯	or	◯	$ 30.00 in 3 weeks
[10]	$ 26.00 today	◯	or	◯	$ 30.50 in 3 weeks
[11]	$ 26.00 today	◯	or	◯	$ 31.00 in 3 weeks
[12]	$ 26.00 today	◯	or	◯	$ 31.50 in 3 weeks
[13]	$ 26.00 today	◯	or	◯	$ 32.00 in 3 weeks
[14]	$ 26.00 today	◯	or	◯	$ 32.50 in 3 weeks
[15]	$ 26.00 today	◯	or	◯	$ 33.00 in 3 weeks
[16]	$ 26.00 today	◯	or	◯	$ 33.50 in 3 weeks
[17]	$ 26.00 today	◯	or	◯	$ 34.00 in 3 weeks
[18]	$ 26.00 today	◯	or	◯	$ 34.50 in 3 weeks
[19]	$ 26.00 today	◯	or	◯	$ 35.00 in 3 weeks
[20]	$ 26.00 today	◯	or	◯	$ 35.50 in 3 weeks

Figure 2: Time Preference Instrument: Part 2

DATE: ____ **ID:** ____

TASK 2 – Decision sheet

For each row, tick (✓) the circle to indicate whether you prefer the amount in 3 weeks or the amount in 6 weeks

Row	amount in 3 weeks		OR		amount in 6 weeks
[1]	$ 26.00 in 3 weeks	◯	or	◯	$ 26.00 in 6 weeks
[2]	$ 26.00 in 3 weeks	◯	or	◯	$ 26.50 in 6 weeks
[3]	$ 26.00 in 3 weeks	◯	or	◯	$ 27.00 in 6 weeks
[4]	$ 26.00 in 3 weeks	◯	or	◯	$ 27.50 in 6 weeks
[5]	$ 26.00 in 3 weeks	◯	or	◯	$ 28.00 in 6 weeks
[6]	$ 26.00 in 3 weeks	◯	or	◯	$ 28.50 in 6 weeks
[7]	$ 26.00 in 3 weeks	◯	or	◯	$ 29.00 in 6 weeks
[8]	$ 26.00 in 3 weeks	◯	or	◯	$ 29.50 in 6 weeks
[9]	$ 26.00 in 3 weeks	◯	or	◯	$ 30.00 in 6 weeks
[10]	$ 26.00 in 3 weeks	◯	or	◯	$ 30.50 in 6 weeks
[11]	$ 26.00 in 3 weeks	◯	or	◯	$ 31.00 in 6 weeks
[12]	$ 26.00 in 3 weeks	◯	or	◯	$ 31.50 in 6 weeks
[13]	$ 26.00 in 3 weeks	◯	or	◯	$ 32.00 in 6 weeks
[14]	$ 26.00 in 3 weeks	◯	or	◯	$ 32.50 in 6 weeks
[15]	$ 26.00 in 3 weeks	◯	or	◯	$ 33.00 in 6 weeks
[16]	$ 26.00 in 3 weeks	◯	or	◯	$ 33.50 in 6 weeks
[17]	$ 26.00 in 3 weeks	◯	or	◯	$ 34.00 in 6 weeks
[18]	$ 26.00 in 3 weeks	◯	or	◯	$ 34.50 in 6 weeks
[19]	$ 26.00 in 3 weeks	◯	or	◯	$ 35.00 in 6 weeks
[20]	$ 26.00 in 3 weeks	◯	or	◯	$ 35.50 in 6 weeks

Figure 3: Risk Instrument

DATE: ____ **ID:** ____

TASK 3 – Decision sheet

For each row, tick (✓) the circle to indicate whether you prefer the left lottery or the right lottery

	Left Lottery				Right Lottery	
Row	5 Chances In 10	5 Chances In 10		OR	5 Chances In 10	5 Chances In 10
[1]	$26	$26	◯	or	◯	$24	$29
[2]	$24	$29	◯	or	◯	$22	$32
[3]	$22	$32	◯	or	◯	$20	$35
[4]	$20	$35	◯	or	◯	$18	$38
[5]	$18	$38	◯	or	◯	$16	$41
[6]	$16	$41	◯	or	◯	$14	$44
[7]	$14	$44	◯	or	◯	$12	$47
[8]	$12	$47	◯	or	◯	$10	$50
[9]	$10	$50	◯	or	◯	$8	$53
[10]	$8	$53	◯	or	◯	$6	$56
[11]	$6	$56	◯	or	◯	$4	$59
[12]	$4	$59	◯	or	◯	$2	$62

Figure 4: Ambiguity Instrument

DATE: ____ **ID:** ____

TASK 4 – Decision sheet

For each row, tick (✓) the circle to indicate whether you prefer the left lottery or the right lottery

	Left Lottery						Right Lottery		
Row	5 Chances In 10	5 Chances In 10	Cost		OR		? Chances In 10	? Chances In 10	Cost
[1]	$26	$26	$1	◯	or	◯	$26	$26	$0
[2]	$24	$29	$1	◯	or	◯	$24	$29	$0
[3]	$22	$32	$1	◯	or	◯	$22	$32	$0
[4]	$20	$35	$1	◯	or	◯	$20	$35	$0
[5]	$18	$38	$1	◯	or	◯	$18	$38	$0
[6]	$16	$41	$1	◯	or	◯	$16	$41	$0
[7]	$14	$44	$1	◯	or	◯	$14	$44	$0
[8]	$12	$47	$1	◯	or	◯	$12	$47	$0
[9]	$10	$50	$1	◯	or	◯	$10	$50	$0
[10]	$8	$53	$1	◯	or	◯	$8	$53	$0
[11]	$6	$56	$1	◯	or	◯	$6	$56	$0
[12]	$4	$59	$1	◯	or	◯	$4	$59	$0
[13]	$2	$62	$1	◯	or	◯	$2	$62	$0

Figure 5: Number of Safe Choices

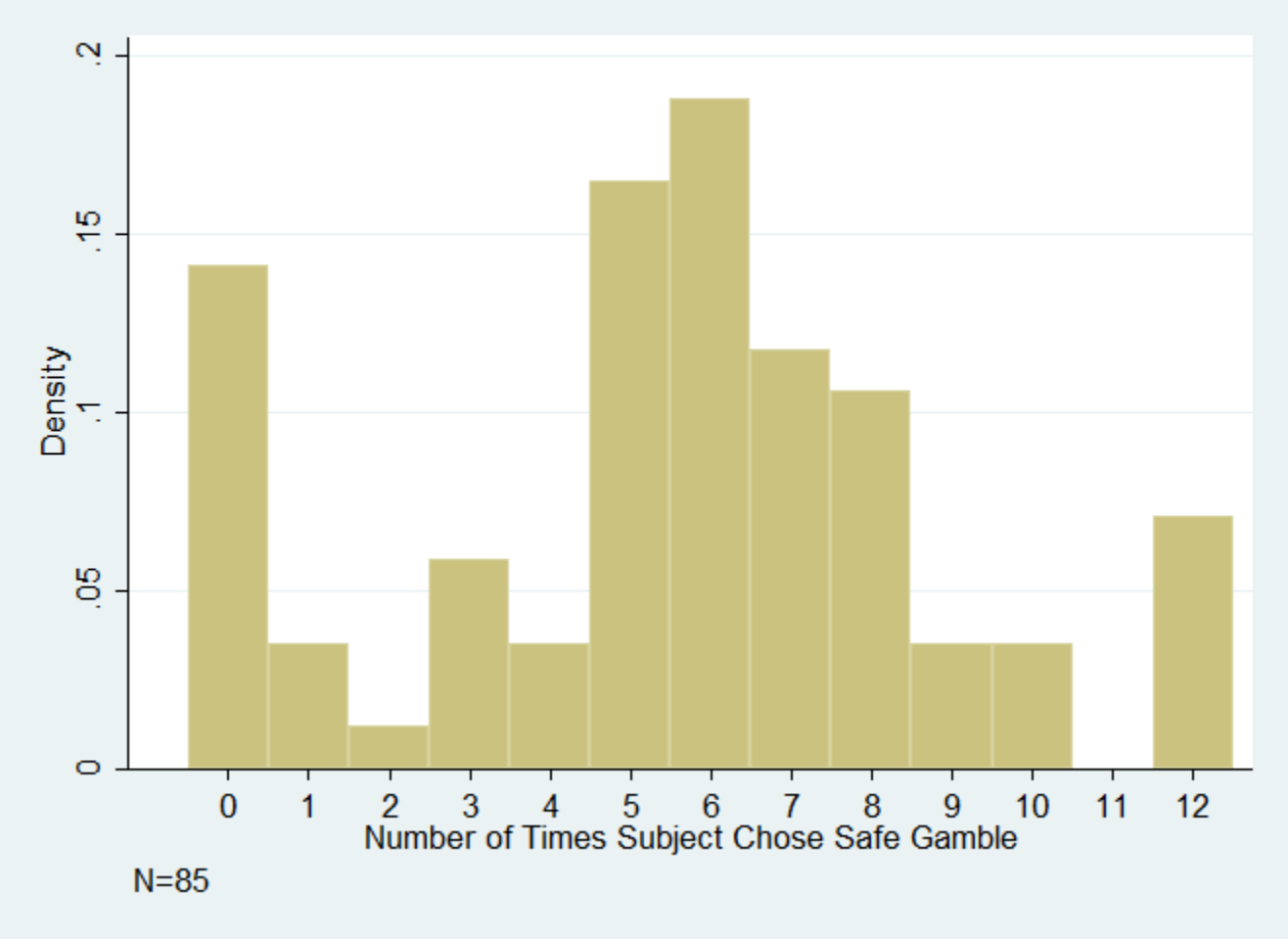

Figure 6: Number of Times Paid to Avoid Ambiguity

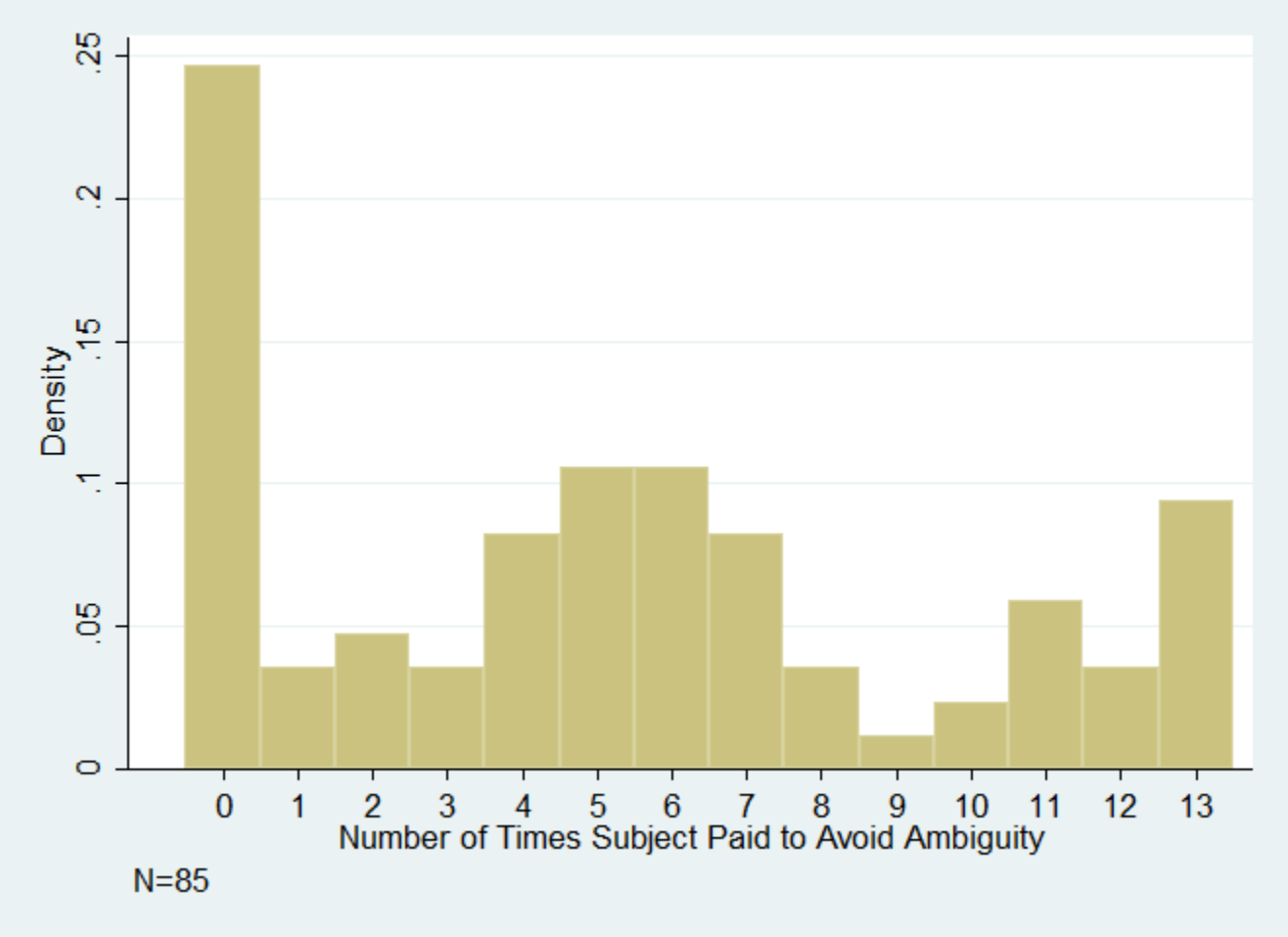

Table 1: Behavioral Preference Measures

Variable	Mean	Std. Dev.
Time preferences		
3-week discount factor - today vs 3 weeks ($\delta_{0,3}$)	0.890	0.097
3-week discount factor - 3 weeks vs 6 weeks ($\delta_{3,6}$)	0.873	0.110
Present-bias discount factor (β)	1.032	0.152
Bias classification		
Present-bias ($\beta < 1$)	0.26	–
No bias ($\beta = 1$)	0.38	–
Future-bias ($\beta > 1$)	0.37	–
Uncertainty preferences		
Number of Safe Choices	5.62	3.28
Number of Times Chose to Pay to Avoid Ambiguity	5.22	4.43

N=82

Table 2: Descriptive Statistics, Exit Survey

Variable	Mean	Std. Dev.
Age	35.55	7.42
Gender (female=1)	0.89	–
Marital status		
Married	0.27	–
Single	0.70	–
Separated	0.01	–
Widowed	0.01	–
Divorced	0.01	–
Highest education level		
None	0.01	–
Primary	0.01	–
Secondary	0.74	–
Post Secondary	0.21	–
Other	0.02	–
Household size	5.96	2.53
Number of adults	2.95	1.55
Number of children	3.01	1.46
Owns automobile	0.31	–
Owns dwelling	0.68	–
Food security		
Severely food insecure	0.69	–
Moderately food insecure	0.27	–
Food Secure	0.05	–
Self-reported health		
Excellent	0.12	–
Very good	0.39	–
Good	0.29	–
Fair	0.11	–
Poor	0.05	–
Don't know	0.04	–

N=82

Table 3: Determinants of Food Choice Factors

Variables	(1) Health	(2) Convenience	(3) Natural Content	(4) Sensory Appeal	(5) Price	(6) Ethical Concern	(7) Familiarity	(8) Weight Control	(9) Mood
Preference Measures									
Long-run Discount Factor ($\delta_{3,6}$)	0.9814	1.0464	1.8109*	-0.6256	1.1827	2.1807	0.3981	0.5612	-0.0211
	[0.685]	[1.289]	[0.973]	[1.263]	[1.543]	[1.554]	[1.074]	[1.013]	[1.045]
Present-bias Discount Factor (β)	2.2561***	-0.5523	2.6985***	1.1366	0.1463	2.6618**	1.9982**	1.6177**	0.7175
	[0.746]	[0.984]	[0.787]	[0.905]	[1.023]	[1.042]	[0.843]	[0.805]	[0.786]
Number of Safe Choices	0.0549**	0.0011	0.0807**	0.0249	0.0412	0.0667*	0.0168	0.0297	0.0551**
	[0.026]	[0.031]	[0.032]	[0.036]	[0.040]	[0.040]	[0.029]	[0.033]	[0.027]
Number of Times Chose to Pay to Avoid Ambiguity	0.0329*	-0.0071	0.0673***	0.0034	0.0313	0.0078	-0.0035	0.0249	0.0136
	[0.018]	[0.025]	[0.022]	[0.023]	[0.026]	[0.025]	[0.020]	[0.022]	[0.020]
Socio-demographic Controls									
Age	0.0224**	-0.0174	0.0297**	0.0112	0.0131	0.0197	0.0177	0.0279**	0.0199**
	[0.009]	[0.013]	[0.013]	[0.015]	[0.017]	[0.020]	[0.012]	[0.011]	[0.010]
Gender (Female = 1)	-0.2339	0.0854	0.2608	0.8081**	0.9862***	0.1687	0.3429	-0.2999	-0.0765
	[0.166]	[0.301]	[0.309]	[0.383]	[0.319]	[0.402]	[0.324]	[0.240]	[0.189]
Secondary Education	0.1732	-0.7584	0.5785*	-0.0851	0.1919	-0.4008	0.0695	0.1988	-0.0947
	[0.164]	[0.594]	[0.325]	[0.252]	[0.373]	[0.519]	[0.222]	[0.326]	[0.275]
Post Secondary Education	-0.0296	-0.7213	0.1696	-0.1663	0.3608	-0.5176	-0.1147	-0.2256	-0.5959*
	[0.202]	[0.662]	[0.381]	[0.346]	[0.426]	[0.621]	[0.326]	[0.369]	[0.325]
Married	0.0835	-0.3963	-0.2618	-0.1931	0.0740	0.1920	-0.0372	-0.1318	-0.3133
	[0.176]	[0.245]	[0.228]	[0.223]	[0.268]	[0.294]	[0.205]	[0.228]	[0.228]
Household Size	0.0291	-0.0092	0.0122	0.0370	0.0013	0.0193	0.0956**	0.0284	0.0169
	[0.029]	[0.046]	[0.036]	[0.039]	[0.048]	[0.058]	[0.039]	[0.032]	[0.040]
Owns Automobile	-0.2224	0.4311*	0.1535	0.0442	-0.2343	-0.0574	-0.2790	-0.0152	-0.0090
	[0.171]	[0.233]	[0.216]	[0.226]	[0.264]	[0.298]	[0.193]	[0.209]	[0.221]
Owns Home	-0.1243	0.1829	-0.2226	-0.3743*	-0.0894	0.1861	-0.1915	-0.1222	-0.2373
	[0.128]	[0.220]	[0.192]	[0.199]	[0.238]	[0.292]	[0.170]	[0.181]	[0.180]
Moderately Food Insecure	-0.1446	0.0798	0.0385	-0.0678	-0.1319	0.4229	0.2347	0.1162	0.2124
	[0.131]	[0.197]	[0.184]	[0.201]	[0.263]	[0.261]	[0.155]	[0.161]	[0.159]
Food Secure	-0.1963	0.2455	-0.3294	0.3111	0.3270	-0.1247	-0.5194	-0.1861	0.1603
	[0.172]	[0.540]	[0.324]	[0.419]	[0.481]	[0.568]	[0.527]	[0.233]	[0.240]
Wald χ^2 test	3.45***	4.32**	2.41***	2.51***	3.64***	1.18	2.00**	2.17***	3.83***
R-squared	0.508	0.325	0.444	0.391	0.355	0.269	0.439	0.387	0.425

N=79. OLS estimates with robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4: Determinants of Frequency of Consumption, by Foods

Variables	(1) Fast Foods	(2) Soda	(3) Fruits and Vegetables
Preference Measures			
Long-run Discount Factor ($\delta_{3,6}$)	-0.1754	-6.3556*	7.7061
	[0.283]	[3.256]	[7.439]
β	-0.0836	2.8240	7.3973*
	[0.245]	[2.250]	[3.879]
Number of safe choices	-0.0089	-0.0828	-0.0093
	[0.007]	[0.084]	[0.120]
Number of Times Chose to Pay to Avoid Ambiguity	-0.0128**	-0.0257	-0.0172
	[0.005]	[0.062]	[0.088]
Socio-demographic Controls			
Age	-0.0053	-0.0297	-0.1173*
	[0.004]	[0.025]	[0.060]
Gender (Female=1)	0.0139	0.7515	-0.5189
	[0.067]	[0.556]	[2.696]
Secondary Education	-0.2016*	-0.8493	-0.6200
	[0.108]	[1.674]	[1.664]
Post Secondary Education	-0.2790**	-2.0659	-2.1563
	[0.117]	[1.687]	[1.772]
Married	-0.0698	-1.0756*	-1.1470
	[0.060]	[0.551]	[0.954]
Household Size	0.0070	-0.0899	-0.1136
	[0.016]	[0.096]	[0.183]
Owns Automobile	0.0741	-0.6159	0.0162
	[0.063]	[0.562]	[0.974]
Owns Home	-0.0672	0.4005	-0.0099
	[0.045]	[0.519]	[0.851]
Moderately Food Insecure	-0.0037	0.0547	0.6681
	[0.047]	[0.555]	[1.026]
Food Secure	0.1128	0.0928	1.4479
	[0.097]	[1.232]	[2.390]
Wald χ^2 test	1.41	3.85***	1.34
Pseudo R-squared	0.1826	0.1214	0.0493

N=79. Tobit marginal effects with robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Determinants of Average Frequency of Consumption, by Energy Density (ED)

Variables	(1) High ED	(2) Medium ED	(3) Low ED
Preference Measures			
Long-run Discount Factor ($\delta_{3,6}$)	-0.0568	-0.8769*	-0.0005
	[0.648]	[0.503]	[0.703]
Present-bias Discount Factor (β)	0.5472	0.5069	0.7771*
	[0.433]	[0.450]	[0.442]
Number of Safe Choices	-0.0228	-0.0133	-0.0027
	[0.016]	[0.014]	[0.014]
Number of Times Chose to Pay to Avoid Ambiguity	0.0043	-0.0315***	-0.0075
	[0.015]	[0.011]	[0.013]
Socio-demographic Controls			
Age	-0.0116*	-0.0009	-0.0119*
	[0.006]	[0.005]	[0.006]
Gender (Female=1)	0.1772	0.0146	0.1111
	[0.115]	[0.156]	[0.213]
Secondary Education	-0.0789	-0.3971	-0.3223
	[0.374]	[0.301]	[0.305]
Post Secondary Education	-0.3423	-0.5616*	-0.6985**
	[0.372]	[0.316]	[0.309]
Married	-0.3473***	-0.2663*	-0.3135***
	[0.113]	[0.148]	[0.110]
Household Size	-0.0513**	-0.0485**	-0.0448*
	[0.019]	[0.021]	[0.024]
Owns Automobile	0.0529	0.1591	0.0259
	[0.102]	[0.132]	[0.109]
Owns Home = 1	-0.0481	-0.1476	-0.0384
	[0.118]	[0.091]	[0.112]
Moderately Food Insecure	-0.1406	-0.0597	-0.0378
	[0.095]	[0.100]	[0.114]
Food Secure	-0.0079	-0.0000	0.1257
	[0.265]	[0.301]	[0.326]
Wald χ^2 test	2.89***	2.06**	2.36***
Pseudo R-squared	0.2850	0.3941	0.2824

N=79. Tobit marginal effects with robust standard errors in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

10 Appendix: Experiment Instructions

Let me explain what you will be doing. In the first part of the session you will be doing 4 main tasks. In each task you will be required to make a number of decisions, to choose between different options. In total you will be making 65 choices and you will be paid for one of these decision. The decision which you will be paid for will be randomly chosen. Each decision has the same chance to be chosen for payment. Since the decision has the same chance to be chosen, each choice you make is important, so think carefully as you make all your decisions.

Now let me explain the decisions you have to make in Task 1 and Task 2.

TASK 1

In Task 1, you will have to make 20 decisions. The decisions are in rows are numbered 1 to 20. In each row, you will have to decide whether you want to get a certain amount of money at an earlier date or another, possibly larger, amount at a later date. In other words, you will be asked to choose between getting a smaller amount of money today and getting a possibly bigger amount of money in three weeks.

We have an example decision sheet on this poster. This example will not be used in the actual decisions you have to make. The amounts of money shown in this example are only to give you a better picture of the type of decisions you have to make. Let us have a look at the example together.

We will ask you to make a decision for each row. It looks like this (point to poster). In the first row you decide whether you prefer receiving $10 today (point to the left) or receiving $10 three weeks from today (point to the right). If you prefer receiving $10 today, tick the left circle (demonstrate). If you prefer receiving $10 three weeks from today, tick the right circle (demonstrate).

In the second row you decide again between receiving $10 today and now receiving a larger amount of $11 three weeks from today. If you prefer taking home $10 today, which circle do you tick? (Assume answer is "left".)

Right, you tick the circle at the left hand side.

If you prefer receiving $11 in three weeks from today, which circle do you tick? (Assume answer is "right".) Right, then you tick the circle at the right hand side.

Is everyone ok so far?

Now, notice that the amount on the left hand side stays constant while the amount on the right hand side increases row by row.

As long as you prefer receiving $10 today, tick the circle at the left hand side. As soon as you prefer receiving the higher amount three weeks from today, tick the circle at the right hand side and then continue to tick the right circle for the rest of the rows.

For example, if you prefer $10 today to $10 dollars in three weeks, then tick the left circle for row 1. If you prefer $10 today to $11 in three weeks, then you tick the left circle for row 2 as well. If you prefer $12 in three weeks to $10 today, then you tick the right circle on the right for row 3 and for the remaining rows, row 4 and row 5, you continue tick the circle on the right.

Let me repeat that. As long as you prefer receiving $10 today, tick the circle at the left hand side. As soon as you prefer receiving the higher amount three weeks from today, tick the circle at the right hand side. Then continue to tick the right circle for the rest of the rows.

For example, if you prefer $10 today to $10 dollars in three weeks, then tick the left circle for row 1. If you prefer $10 today to $11 in three weeks, then you tick the left circle for row 2 as well. If you prefer $10 today to $12 in three weeks, then again you tick the left circle

for row 3. In row 4 if you prefer $13 in three weeks to $10 today, then you tick the right circle and for the remaining row, row 5, tick the right circle again.

(Ask) Does anyone have any questions?

(Leave time for questions and answers)

So in Task 1, you will have to make 20 decisions like this and the decisions are in rows are numbered 1 to 20. And remember the numbers in the poster are just examples. So the numbers on your decision sheet will be different.

Now, if a decision from Task 1 is chosen for payment and your choice for that decision is to get money "today", you will get a check dated today at the end of the session for the amount. If your choice for that decision is to get money "in three weeks" you will get a check dated 3 weeks from today _____ [put actual date] for the amount. This check can be only be cashed or deposited in the bank on or after _____ [put actual date].

(Ask) Does anyone have any questions?

(Leave time for questions and answers)

I will now explain the decisions you have to make in Task 2.

TASK 2

For Task 2, you will also have to make 20 decisions. The decisions are in rows which are numbered 1 to 20. Similar to task 1, in each row, you will have to decide whether you want to get a certain amount of money at an earlier date or another, possibly larger, amount at a later date. In other words, you will be asked to choose between getting a smaller amount of money in three weeks and getting a possibly bigger amount of money in six weeks.

This poster shows an example decision sheet for Task 2. In this example you have to decide

whether you prefer receiving $10 three weeks from now or if you prefer receiving a possibly larger amount six weeks from now. The rules to fill out the decision sheet are the same as for Task 1. If you prefer receiving the money in three you tick the circle on the left and if you prefer receiving the money in six weeks you tick the circle on the right. As soon as you have ticked the circle at the right hand side that is as soon as you prefer receiving the money in six weeks, continue to tick the right circle for the rest of the rows.

For example, if you prefer $10 in three weeks to $10 dollars in six weeks, then tick the left for row 1. If you prefer $10 in three weeks to $11 in six weeks, then you tick the left circle for row 2 as well. If you prefer $12 in six weeks to $10 in three weeks, then you tick the right circle for row 3. Then for the remaining rows, rows 4 and 5, tick the circle on the right.

So in Task 2, you will have to make 20 decisions like this and the decisions are in rows are numbered 1 to 20. And remember the numbers in the poster are just examples. So the numbers on your decision sheet will be different.

If a decision from Task 2 is chosen for payment and your choice for that decision is to get money "in three weeks", you will get a check dated 3 weeks from today _____ [put actual date] at the end of the session for the amount. This check can be only be cashed or deposited in the bank on or after _____ [put actual date]. If your choice for that decision is to get money "in six weeks" you will get a check dated 6 weeks from today _____ [put actual date] at the end of the session for the amount. This check can be only be cashed or deposited in the bank on or after _____ [put actual date].

(Ask) Does anyone have any questions?

(Leave time for questions and answers)

Before I explain the decisions you will make in Task 3 and Task 4, let me show you two of the tools we will be using.

In front of me there are two bags: one is black and one is grey.

Inside the black bag there are 10 chips. 5 of the chips are BLUE and 5 are YELLOW. Can I have a volunteer to verify that there are 5 blue chips and 5 yellow chips in the bag? (Volunteer verifies). Whenever we use this bag you will pull one chip from the bag without looking in the bag. It works like this (walk around the room with the bag and pull and show).

Inside the grey bag there are also 10 chips. All of the chips are either BLUE or YELLOW (shake it). You don't know how many are BLUE or how many are YELLOW (put the bag back down). Whenever we use this bag you will pull one chip from the bag without looking in the bag.

I will now explain the decisions you will make in Task 3 and Task 4.

TASK 3

In Task 3, you will have to make 12 decisions. The decisions are in rows numbered 1 to 12. Each row on the decision sheet represents a choice between two lotteries: a left lottery and a right lottery. In each lottery there are two possible outcomes - a high amount and a low amount. Each outcome occurs in the left lottery with 5 chances in 10 or 50 percent chance. Each outcome occurs in the right lottery with 5 chances in 10 or 50 percent chance. So in each row, you will have to decide whether you prefer the left lottery or the right lottery.

This poster shows an example decision sheet for Task 3. This example will not be used in the actual decisions you have to make. The amounts of money shown in this example are only to give you a better picture of the decisions you have to make. Let us have a look at the example together.

In this example, in each row you have to decide whether you prefer the left lottery or the right lottery. In the first row, you have to choose between the left lottery that earns $10

with 5 chances in 10 or $10 with 5 in $10 chance and the right lottery that earns $9 with 5 chances in 10 or $12 with 5 chances in 10. In other words, in the left lottery you have a 50 percent chance of earning $10 and a 50 percent chance of earning $10 while in the right lottery you have a 50 percent chance of earning $9 and a 50 percent chance of earning $12. So you have to choose which lottery you prefer.

If you prefer the left lottery, tick the left circle (demonstrate). If you prefer the right lottery, tick the right circle (demonstrate).

(Ask) Does anyone have any questions?

(Leave time for questions and answers)

Let us look at another row. In row 3 there is a choice between the Left Lottery that earns $8 with 5 chances in 10 or $14 with five chances in 10, and the Right Lottery that earns $7 with 5 chances in 10 or $16 with 5 chances in 10. In other words, in the left lottery you have a 50 percent chance of earning $8 and a 50 percent chance of earning $14 while in the right lottery you have a 50 percent chance of earning $7 and a 50 percent chance of earning $16.

In each of the 12 rows, tick the circle for the lottery you prefer. So if you prefer the left lottery tick the left circle and if you prefer the right lottery tick the right circle and you do this for each row on the sheet.

Does anyone have any questions? (Leave time for questions and answer)

If a decision from Task 3 is chosen for payment you will get a check dated today at the end of the session for the amount of your earnings. To determine how much you will earn, you will pick a chip from the black bag to determine whether you earn the high or the low amount. Remember this bag has 10 chips, 5 of them are BLUE and 5 of them are YELLOW (Lift black bag). Before you pull a chip from the bag, you will decide which colour, the BLUE or YELLOW is the winning colour. The winning colour pays the high amount. For instance,

in our example, in row three for the left lottery, the winning color pays $14. For the right lottery, the winning colour pays $16.

Would someone please choose blue or yellow for the winning colour? (Ask someone).

Now pick a chip from the bag. (Have someone pull a chip from the green bag)

The colour of the chip is _____. The colour (is or is not) the winning colour. Let suppose that row 3 is chosen for payment. If you chose the left circle, you would earn $14 or $8. If you chose the right circle you would earn $16 or$7.

Does anyone have any questions? (Leave time for questions and answer)

Now let me now explain the decisions for Task 4.

TASK 4

In Task 4, you will have to make 13 decisions. The decisions are in rows numbered 1 to 13. Each row on the decision sheet represents a choice between two lotteries: a left lottery and a right lottery. Each lottery has two possible outcomes - a high amount and a low amount. Each outcome in the left lottery occurs with 5 chances in 10 or 50 percent chance. Each outcome in the right lottery occurs with an unknown number of chances out of 10 or an unknown percent chance. The left lottery costs $1.00 and the right lottery costs $0.00.

Let me explain some more using the example on this poster. The high and low amounts are the same for both lottery in each row. The differences are that: first for the left lottery, you know that each outcome has a 5 chances in 10 or 50 percent change and for the right lottery you don't know the chances in 10 or percent chance of each outcome and second, the left lottery cost $1.00 and the right lottery cost $0.00. Here in row 3 you have to choose between the left lottery that earns $8 with 5 chances out of 10 and $14 with five chances out of 10, that is there is a 50-50 chance that you earn either $8 or $14 and the right lottery and

earns $8 with an unknown number of chances out of 10 and $14 with an unknown number of chances out of 10, that is you do not know the chances of earning $8 or $14. The left lottery costs $1.00 and the right lottery costs $0.00.

In each of the 13 rows, tick the circle of the lottery you prefer. So if you prefer the left lottery tick the left circle and if you prefer the right lottery tick the right circle.

Does anyone have any questions? (Leave time for questions and answer)

If a decision from Task 4 is chosen for payment you will get a check dated today at the end of the session for the amount of your earnings.

If you chose the left lottery, then you will pick a chip from the black bag. Remember the black bag has 10 chips, 5 of them are BLUE and 5 of them are YELLOW (Lift black bag). Before you pull a chip from the bag, you will decide which colour, the BLUE or YELLOW is the winning colour and the winning colour pays the high amount. Remember that the left lottery also costs $1, so you will pay $1.00 out of the amount you earn.

If you chose the right lottery, you will pick a chip from this grey bag to determine how much money you earn. This grey bag has 10 chips, all of them BLUE or YELLOW but you do not know how many are blue or yellow. Before you pull a chip from the bag, you will decide which colour, the BLUE or YELLOW is the winning colour and the winning colour pays the high amount. Since the right lottery does not cost any money, you will earn the total amount of the outcome.

Does anyone have any questions?

(Leave time for questions and answer)

PAYMENT

I will now explain exactly how you choose which decision you will be paid for. Let me show

you the tools we will be using to determine your payment. I have here 4 bags: one is blue, one is green, one is orange and one is maroon.

Inside the blue bag, there are 4 chips that look like this (pull one out). Each chip has a number from 1 to 4. Whenever we use this bag you will pull one chip from the bag without looking in the bag. It works like this (walk around the room with the bag and pull and show).

Inside the green bag, there are 12 chips that are numbered 1 to 12. Whenever we use this bag you will pull one chip from the bag without looking in the bag. It works like this (walk around the room with the bag and pull and show).

Inside the orange bag, there are 13 chips that are numbered 1 to 13. Whenever we use this bag you will pull one chip from the bag without looking in the bag. It works like this (walk around the room with the bag and pull and show).

Inside the maroon bag, there are 20 chips that are numbered 1 to 20. Whenever we use this bag you will pull one chip from the bag without looking in the bag. It works like this (walk around the room with the bag and pull and show).

To determine which decision you will be paid for, you will first choose the task for which you are paid by picking a chip from the blue bag which has chips numbered from 1 to 4. The number on the chip determines the task that you are paid for. It works like this. Can I have a volunteer to pick a chip from the blue bag?

(Demonstrate with the blue bag)

Since the number on the chip is X, you will be paid for one of your decisions in Task X. Since you might be paid for any of the four tasks, all the decisions you make for each task is important.

If you pick Task 1 or Task 2 for payment, you will pick a chip from the maroon bag to determine which decision you will be paid for. Remember this bag has 20 chips numbered 1 to 20. The number on the chip will be the number of the decision that you are paid for. It works like this. Can I have a volunteer to pick a chip from the maroon bag?

(Demonstrate with the maroon bag)

Since the number on the chip is X, you will be paid for your decision in row X.

If you pick Task 3 for payment, you will pick a chip from the orange bag to determine which decision you will be paid for. Remember this bag has 12 chips numbered 1 to 12. The number on the chip will be the number of the decision that you are paid for. It works like this. Can I have a volunteer to pick a chip from the orange bag?

(Demonstrate with the orange bag).

Since the number on the chip is X, you will be paid for your decision in row X. If you have picked the left lottery, you will play this lottery for payment by picking a chip from the black bag. If you picked the right lottery, you will play this lottery for payment by picking a chip from the black bag.

If you pick Task 4 for payment, you will pick a chip from the green bag to determine which decision you will be paid for. Remember this bag has 13 chips numbered 1 to 13. The number on the chip will be the number of the decision that you are paid for. It works like this. Can I have a volunteer to pick a chip from the green bag?

(Demonstrate with the green bag).

Since the number on the chip is X, you will be paid for your decision in row X. If you have picked the left lottery, you will play this lottery for payment by picking from the black bag. If you picked the right lottery, you will play this lottery for payment by picking a chip from

the grey bag.

Let's do a few examples. Can I get a volunteer to help me.

So first you pick which task you will be paid for, so select a chip from the blue bag.

You have picked Task X. So you pick a chip from X bag to determine which decision you are paid for. . If picked 3 or 4, you then say which colour is the winning colour, then pick a chip from X bag to determine how much you earn.

(REPEAT WITH 2 MORE VOLUNTEERS)

(Collect the decision sheets)

Does anyone have any questions?

(Leave time for questions and answer)

After you have made all your decisions, in the second part of the session we would like you to fill out a questionnaire on the foods that you and your child eat and what issues are important in determining your food choices. Just raise your hand when you are finished making your decisions and we will give you the questionnaire. If you have any questions as you fill in the questionnaire, just raise your hand and one of us will assist you.

Remember you will be paid for one decision in one of the tasks, so each decision is important.

_____ and _____ are now distributing the decision sheets. Remember to write your ID number at the top of the page.

You can go ahead and make your decisions.

FOOD QUESTIONNAIRE

(If everyone finishes at approximately the same time) Now that you have made all your

decisions, we would like you to fill out a questionnaire on the foods that you eat and what issues are important in your food choices. Just raise your hand and we will distribute the questionnaire.

If you have any questions as you fill in the questionnaire, just raise your hand and one of us will assist you.

Once you have finished the questionnaire, raise your hand and we will distribute a sheet with a few short questions about the nutrients in food. Read the instructions on the cover page very carefully. After you have completed the questions, you will be directed to one of the field assistants to complete a short survey. Once you have completed the survey, you will go to (TABLE/ROOM) where you will be aid privately.

After you are paid you are free to leave and we have some drinks.

Are there any questions? (Leave time for questions and answer)

Thank you for participating in our study. You can now proceed to answer the questionnaire.

11 Appendix A: Food Choice Questionnaire

Tick (✓) the circle indicating the importance of each statement GIVE AN ANSWER FOR EVERY LINE TICK ONLY ONE ANSWER PER LINE					
It is important to me that the food I eat on a typical day:	**Very Unimportant**	**Unimportant**	**Neither Important or Unimportant**	**Important**	**Very important**
1. …is easy to prepare	○	○	○	○	○
2. …contains no additives	○	○	○	○	○
3. …is low in calories	○	○	○	○	○
4. …tastes good	○	○	○	○	○
5. …contains natural ingredients	○	○	○	○	○
6. …is not expensive	○	○	○	○	○
7. …is low in fat	○	○	○	○	○
8. …is familiar to me	○	○	○	○	○
9. …is high in fibre and roughage	○	○	○	○	○
10. …is nutritious	○	○	○	○	○
11. …is easily available in shops and supermarkets	○	○	○	○	○
12. …is good value for money	○	○	○	○	○
13. …cheers me up	○	○	○	○	○
14. …smells nice	○	○	○	○	○
15. …can be cooked very simply	○	○	○	○	○
16. …helps me cope with stress	○	○	○	○	○
17. …helps me control my weight	○	○	○	○	○
18. …has a pleasant texture	○	○	○	○	○
19. …is packaged in an environmentally friendly way	○	○	○	○	○
20. …comes from countries I approve of politically	○	○	○	○	○
21. …is like the food I ate when I was a child	○	○	○	○	○

Caregiver Statement Importance 3

Tick (✓) the circle indicating the importance of each statement GIVE AN ANSWER FOR EVERY LINE TICK ONLY ONE ANSWER PER LINE					
It is important to me that the food I eat on a typical day:	**Very Unimportant**	**Unimportant**	**Neither Important or Unimportant**	**Important**	**Very important**
22. …contains lots of vitamins and minerals	○	○	○	○	○
23. …contains no artificial ingredients	○	○	○	○	○
24. …keeps me awake and alert	○	○	○	○	○
25. …looks nice	○	○	○	○	○
26. …helps me relax	○	○	○	○	○
27. …is high in protein	○	○	○	○	○
28. …takes no time to prepare	○	○	○	○	○
29. …keeps me healthy	○	○	○	○	○
30. …is good for my skin/teeth/hair/nails etc	○	○	○	○	○
31. …makes me feel good	○	○	○	○	○
32. …has the country of origin clearly marked	○	○	○	○	○
33. …is what I usually eat	○	○	○	○	○
34. …helps me to cope with life	○	○	○	○	○
35. …can be bought in shops close to where I live or work	○	○	○	○	○
36. …is cheap	○	○	○	○	○

12 Appendix B: Food Frequency Questionnaire

Tick (✓) the circle indicating how many times per day, week or month on average YOU consume each of food items listed GIVE AN ANSWER FOR EVERY LINE, EVEN IF IT IS "NEVER OR LESS THAN ONCE A MONTH" TICK ONLY ONE ANSWER PER LINE		Never or less than 1 per month	1 - 3 per month	1 per week	2 - 4 per week	5 - 6 per week	1 per day	2 - 3 per day	4 -5 per day	6+ per day
Dairy Foods										
1.	Milk *(do not include small amounts of milk in coffee or tea and include chocolate milk or other flavoured milk)*	○	○	○	○	○	○	○	○	○
2.	Cheese (e.g. Cheddar, cheese slices, etc.)	○	○	○	○	○	○	○	○	○
Fruits and Fruit Juices										
3.	100 percent fruit juices such as orange, apple, grape, etc. *(do not include fruit-flavoured drinks with added sugar or fruit juice made at home with added sugar)*	○	○	○	○	○	○	○	○	○
4.	Fruit *(include canned, frozen and fresh fruit eaten on its own or with other food, cooked or raw)*	○	○	○	○	○	○	○	○	○
5.	Green salad *(salad that includes lettuce with or without other ingredients)*	○	○	○	○	○	○	○	○	○
6.	Potatoes *(do not include French fries, fried potatoes or potato chips)*	○	○	○	○	○	○	○	○	○
7.	Carrots *(include canned, frozen and fresh, eaten on their own or with other food, cooked or raw)*	○	○	○	○	○	○	○	○	○
8.	Ground provision such as yams, sweet potato, etc.	○	○	○	○	○	○	○	○	○
9.	Other vegetables *(not including carrots, potatoes, green salad or ground provision)*	○	○	○	○	○	○	○	○	○
Fish and Seafood										
10.	Fresh or frozen fish *(do not include salted fish)*	○	○	○	○	○	○	○	○	○
11.	Canned fish e.g. sardine, tuna, mackerel etc. *(include canned with water, oil or other flavourings)*	○	○	○	○	○	○	○	○	○
12.	Lobster, crab or other shellfish	○	○	○	○	○	○	○	○	○
13.	Saltfish *(include fish cakes, eaten with other foods etc.)*	○	○	○	○	○	○	○	○	○
Legumes										
14.	Beans *(include baked beans, beans in soup or any other type of cooked beans)*	○	○	○	○	○	○	○	○	○
15.	Peas such as pigeon peas, lentil peas, etc. *(include peas in soup, mixed dishes or any other type of cooked peas)*	○	○	○	○	○	○	○	○	○

Tick (✓) the circle indicating how many times per day, week or month on average YOU consume each of food items listed GIVE AN ANSWER FOR EVERY LINE, EVEN IF IT IS "NEVER OR LESS THAN ONCE A MONTH" TICK ONLY ONE ANSWER PER LINE									
	Never or less than 1 per month	1 - 3 per month	1 per week	2 - 4 per week	5 - 6 per week	1 per day	2 - 3 per day	4 -5 per day	6+ per day
Meats and Eggs									
16. Processed meat such as salami, luncheon meat, Vienna sausage, hot dogs, bacon etc. *(include processed meats you had in sandwiches, soups and other mixtures)*	○	○	○	○	○	○	○	○	○
17. Red meat such as pork, beef, mutton, goat or lamb *(include red meat you had in sandwiches, stews and other mixtures)*	○	○	○	○	○	○	○	○	○
18. Chicken, turkey or other poultry *(include poultry you had in sandwiches, stews and other mixtures)*	○	○	○	○	○	○	○	○	○
19. Eggs including the yolk *(include any preparation and omelets)*	○	○	○	○	○	○	○	○	○
Breads, Cereals and Pasta									
20. White bread	○	○	○	○	○	○	○	○	○
21. Whole wheat or whole grain bread	○	○	○	○	○	○	○	○	○
22. Rice *(include white rice in mixtures e.g. rice and peas)*	○	○	○	○	○	○	○	○	○
23. Dry cereal e.g. Corn Flakes *(do not include hot cereals such as cream of wheat, etc.)*	○	○	○	○	○	○	○	○	○
24. Pasta	○	○	○	○	○	○	○	○	○
Other Foods									
25. Regular soda or soft drinks that contain sugar *(do not include diet soda)*	○	○	○	○	○	○	○	○	○
26. Fast foods such as KFC, French fries, pizza, etc.	○	○	○	○	○	○	○	○	○
27. Sweetened fruit drinks such as kool-aid, fruit punch drink, etc. *(include fruit juices you made at home and added sugar to)*	○	○	○	○	○	○	○	○	○
28. Cookies, cake, pie or brownies *(do not include sugar-free ones)*	○	○	○	○	○	○	○	○	○
29. Chocolate or other type of candy *(do not include sugar-free candy)*	○	○	○	○	○	○	○	○	○
30. Ice Cream or other frozen dessert *(do not include sugar-free kind)*	○	○	○	○	○	○	○	○	○

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