Consistency of Microeconomic Behaviour across Canada

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Abstract: Standard economic models do not always accurately predict human behaviour. While deviations from economic theory are often qualitatively consistent across different populations and/or across different timeframes, it is important to appreciate that even small deviations in behaviour can have significant implications for the effectiveness of institutions and the efficacy of policy. Although previous studies have, within the context of a specific game, focused on how a specific human behaviour has deviated from the predictions of economic models, this study, utilizes a battery of four games, coupled with a socio-demographic survey, to search for consistency in behaviour across games and across three distinct regions of Canada: Saskatchewan, New Brunswick, and Newfoundland and Labrador. The empirical finding demonstrated a high degree of qualitative similarity in behaviours among subjects in these different locations, but there were statistically significant differences in quantitative behaviour along multiple dimensions.

1. Introduction

As experimental economists probe deeper into human behaviour, it is becoming more established that the predictions emanating from traditional economic models do not reflect the behaviour of human beings in all circumstances. In particular, people regularly engage in spiteful behaviour as exhibited by refusing to accept positive offers within ultimatum games;[1] display generosity by donating anonymously within dictator games;[2] cooperate in prisoner's dilemma games by opting for socially optimal action;[3] and demonstrate an aversion to penalty-free lying in cheap-talk games.[4] Interestingly, these observations are different from that which would be predicted by traditional theory. Moreover, these deviations from theoretical predictions can have important implications for the design and implementation of economic and social policy.

Experimental economics has enhanced our understanding of human behaviour and has improved the design of economic policy in light of the consistent deviations of human behaviour from the predictions provided by traditional economic models. The work of 2017 Nobel Prize winner Richard Thaler and his collaborator Cass Sunstein on "nudges" (Thaler & Sunstein, 2008) exemplifies these contributions.

However, much of the research in experimental economics analyzes a single facet of human behaviour in isolation and, often, the experiment draws subjects from a single population or location. By way of illustration, the original work on behaviour in the ultimatum game was conducted using graduate students at the University of Cologne as subjects (Guth & Schwarze, 1982). Likewise, Thaler's experiments on the endowment effect (Kahneman, Knetsch, & Thaler, 1990) made use of Cornell University students as subjects. While the essential qualitative results of both of these classic experiments (and many others) have been replicated around the world in a multitude of contexts, it is important to appreciate that small quantitative differences can have dramatic implications for the design of public policy. For instance, subjects in the ultimatum game consistently reject offers that are low, but positive. Within this game, for example, if subjects in one jurisdiction are consistently willing to accept offers which are equivalent to 31% of the funds available for sharing while subjects in another

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[1] Guth and Schwarze (1982) originally proposed the ultimatum game in order to understand how bargaining between two parties might lead to an agreement on a specific transaction. In the simplified ultimatum game, one subject – known as the proposer - proposes a price between the minimum the seller is willing to accept and the maximum the buyer is willing to pay, which effectively is a proposal on how to divide the surplus from the specific transaction. The other party – known as the responder – either accepts or rejects the proposed price/division of surplus. Acceptance implies the surplus is split as proposed by the proposer and rejection implies that no transaction takes place, no surplus is created and neither party receives any benefit.

[2] The dictator game, Forsythe, Horowitz, Savin, & Sefton (1994), is a variant of the ultimatum game where the dictator indicates to the second player how the surplus of a transaction will be split between himself/herself and the other player, with no opportunity for the responder to accept or reject the offer.

[3] The prisoner's dilemma game, see Flood (1952), investigates whether cooperation between the two players leads to the social optimum where both player gain, but where the individual incentive structure is such that it is in each player's self-interest to betray the other, and, as such, neither players cooperates and each play betrays other. In the end, the worst outcome for each player prevails when the best solution is available and would be achieved through cooperation.

[4] The cheap-talk game is a variant of the sender-receiver game in which the sender provides information and the receiver acts on this information. The variant is encompassed by the fact that the provision and receipt of information is free and does not does not directly affect the payoff of the game. The sender-receiver game used in this analysis is based on Gneezy (2005).

jurisdiction are only willing to accept offers greater than 44% of the available funds, then this may have significant economic implications for the two regions. In particular, the jurisdiction in which people are more willing to reject positive economic offers is likely to face higher resistance to economic development or to reject contracts that result in benefits that are unevenly distributed. Given these specific experimental results, in order to design effective economic and social policies, local preferences will have to be taken into consideration. In particular, even though experiments in both locations exhibit the same qualitative results that some positive offers are not accepted, small differences in the typical size of the rejected offer may matter.

Interestingly, implicit in the design of "nudges," advocated by Thaler and Sunstein (2008), is the notion that the behaviour of individuals in one economic game is generalizable to other environments. Consequently, relatively few experiments analyse the behaviour of subjects across multiple dimensions or within multiple games. If the behaviour in economic experiments transcends the specific environment, one game, such as the ultimatum game, will be sufficient to identify a broad class of behaviours, which can then lead to appropriately designed policy. However, if behaviour is driven by a nuanced preference relation, or is the result of a collection of heuristics, rather than deliberate optimization given a specific preference relation, then a slight change in environment may dramatically change behaviour and this needs to be taken into account in using the lessons of economic experiments as an input into policy development. In these circumstances, multiple games, at a minimum, will be required to identify either the preference structure or the multiple heuristics.

In additional to potentially varying on the basis of location (a proxy for culture), the economic behaviour of individuals may also vary as a result of their differing socio-demographic characteristics. For instance, Dreber and Johannesson (2008) showed that Swedish males are more willing to lie for a monetary reward than are females. This illustrates males and females are likely to differ in predictable ways, which may be due either socialization or biology. Additionally, gender differences in behaviour may also be location dependent. For instance, Childs (2012) finds no difference in willingness to lie between males and females within Canada.

Incorporating these potential differences in behaviour requires a broader perspective than is typically utilized in research drawing upon economic experiments. Consequently, this study constructs a battery of fairly simple experiments to assess the behaviour of a sample of individuals across an array of environments. The subjects in this experiment participated in the ultimatum game (Guth & Schwarze, 1982), the dictator game (Forsythe, Horowitz, Savin, & Sefton, 1994), the sender-receiver game (Gneezy, 2005), and prisoners' dilemma game (Flood, 1952). As well the subjects in these experiments completed both price-list–risk-attitude exercises (Holt & Laury, 2002) and discount rate exercises (Coller & Williams, 1999). All of these games were financially motivated and subjects received compensation based upon both their decisions and the decisions of others within each game/exercise. The approach employed in this paper is similar to that adopted in Dean and Ortoleva (2016). Finally, the experiments were performed at three different locations within Canada - Saskatchewan (Saskatoon), New Brunswick (Saint John), and Newfoundland and Labrador (St. John's). Furthermore, it is important to appreciate that while these locations were separated physically, with the closest being New Brunswick and Newfoundland and Labrador which were more than 1,700 kilometers apart by road and ferry, and all have different histories and eras of European settlement, and all three location have identical or very similar institutions. Given these specific characteristics and locations, differences in behaviour can be attributed to cultural, rather than institutional, differences.

2. Experiments and Socio-Demographic Survey

This analysis presented below considers six distinct elements of behaviour. Specifically, the ultimatum and dictator games were utilized to assess inequality aversion,[5] the sender-receiver game was employed to evaluate differences in willingness among populations to lie for a financial gain, the prisoner's dilemma game illustrates cooperative tendencies versus self-interest, a price list over lotteries tests differences in risk preferences, and a price list over payments, instantaneously or delayed by one month, captures differences in the ability to defer gratification among people at the sample locations. Additionally, these experiments control for a variety of socio-demographic variables in order to distinguish personal characteristics from locational specific effects. In particular, subjects indicated their gender, which enables one to determine whether an observed proclivity to lie is due to location/cultural factors or simply because the Newfoundland and Labrador sample, for example, contains more males than the sample drawn from New Brunswick. The details of each game and the specific questions of the socio-demographic survey are discussed in the remainder of this section.

2.1 Ultimatum and Dictator Games

The ultimatum and dictator games have a long history in experimental economics, originating with Guth and Schwarze (1982). The games were originally designed to facilitate the understanding of bargaining between two parties in advance of agreeing to a specific transaction. In the simplified ultimatum game, one party to the potential transaction – known as the proposer - proposes a price between the minimum the seller is willing to accept and the maximum the buyer is willing to pay. This effectively is a proposal on how to divide the surplus from the transaction. The other party – known as the responder – either accepts or rejects the proposed price/division of surplus. If the responder accepts proposal, the transaction takes place at the proposed price and the surplus is split in the manner suggested by the proposer. If the responder rejects the proposal, no transaction takes place, no surplus is created and neither party receives any benefit.

Based on traditional economic theory, the proposer will make the smallest possible positive offer and the responder will accept any offer greater than zero. The logic being that if, as theory predicts, individuals care only about their absolute monetary payoff and rejection of the proposal leads to a payoff of zero for both the responder and the proposer, accepting any offer is better than receiving nothing. Given this theoretical prediction, proposers should offer the smallest positive amount they can (one penny if possible) and retain for themselves virtually all of the surplus. However, contrary to the prediction of traditional economic theory, typical offers are equivalent to 40% of the funds to be divided and offers below 30% are routinely rejected. Another interesting finding is that the behaviour of responders differs, notably among locations (Oosterbeek, Sloof, & Van de Kuilen, 2004). The choices made in the ultimatum and dictator games indicates the degree to which subjects take others into account when making decisions – the degree to which they can be said to have other-regarding preferences[6]. Thus differences in behaviour among locations would indicate different concern for others within a population, or at least within in the sample tested in this paper.

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[5] Inequality aversion, as explained in Fehr and Schmidt (1999), is a preference for fairness and resistance to incidental inequalities.

[6] Typically, economic model assume that individual optimization are based upon self-interest. In some circumstances, decisions are not exclusively motivate by self-interest. In these cases, the individual is assumed to have other-regarding preferences. Again see Fehr and Schmidt (1999) and the subsequent literature.

In this analysis, subjects in all three locations were asked to play the role of both proposer and responder in the battery of experiments undertaken. Subjects first acted as the proposer, suggesting a division of $10 lab dollars, in whole dollars, between themselves and an anonymous other subject in the same session of the experiment. Subjects were then asked, via the strategy elicitation method[7], whether they would accept or reject each potential offer. The lowest offer that they indicated they were willing to accept is identified as the minimum acceptable offer in the analysis presented in Section 3 of this paper.

The ultimatum game has a clear prediction for the simply self-interested, hyper-rational homoeconomicus in an environment in which such rational self-interest is common knowledge. Yet, even a purely self-interested agent can be induced to offer more than the minimum payment possible if they believe the responder might reject small positive offers. Thus, significant positive offers might not necessarily be indicators of other-regarding preferences, but may simply be reflective of the proposer's adoption of a pragmatic strategy. Given the possibility of pragmatism, Forsythe et al. (1994) develop an even simpler bargaining experiment, the dictator game, in order to clearly identify altruism, or a preference for fairness. In the dictator game, the proposal is automatically enacted. The player in the role of the responder has no opportunity to accept or reject offers. Consequently, any positive offer in the dictator game must be driven by some innate preference over distributions, resulting from some preference for fairness, altruism, or self-image, rather than as a hedge against an offer being rejected.

By considering the three distinct decisions of subjects in these games (ultimatum proposer, ultimatum responder, and dictator), it is possible to evaluate an individual's preference for fairness, both when the distribution of benefits is more advantageous to them and when the distribution of benefits is more advantageous to others. This approach is equivalent to adopting the inequality aversion interpretation of behaviour in these environments that underpins Fehr and Schmidt (1999).

Figures 1 and 2 show the exact versions of the games presented to subjects. The responder portion of the ultimatum was not visible until the proposer portion of the game had been completed.

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[7] The strategy elicitation method requires subjects to identify the actions that they would take in every possible choice made by another player that could occur in the experiment, while the direct response method only asks subjects to respond to the actual choices of others. See Brandts and Charness (2011) for a comparison of the two methods.

Figure 1: The Proposer's Screen

Figure 2: The Responder's Screen

Section 2

In this decision task, you are *Person 1*

You have $10 LAB dollars. You must decide upon a whole number {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10} to give (call this *$give*) to *Person 2*. *Person 2* will get *$give* and you keep ($10 - *$give*) in LAB dollars.

For this decision, $1 LAB = $0.25 CDN.

You do not know the identity of your counterpart. It is not likely to be a person you have been matched with before.

The outcome of your decision will be added to your total which will be revealed at the end of the session.

DECISION

As *Person 1*, I will give *Person 2*

_____ LAB dollars

Please review your choices and click Submit

✔ Submit

2.2 Sender-Receiver Game

Lying and distrust are destructive to economies. In fact, greater degrees of trust have been shown to be correlated with higher levels of economic development, see Bjornskov (2012) for an examination of multiple strands of the literature in this area. Consequently, the prevalence of lying and trust offer an important insight to economic potential in different regions. The specific form of the sender-receiver game adopted in this battery of experiments is based on Gneezy (2005).   In this experiment, half of subjects (the senders) is shown two different payoff distributions labelled A and B. In distribution A, the sender receives 15 lab dollars and the receiver is allocated 5 lab dollars, while in distribution B, it is reversed, with the sender being allocated 5 lab dollars and the receiver gets 15 lab dollars. The sender, then transmits a message to the receiver of the form "Option X (either A or B at the sender's discretion) will pay you more money." If a sender's message does not match the payoff distributions they were shown, they have opted to lie. If the message is accurate, they have been honest and told the truth.

The remaining subjects, receivers, then choose whether to believe the senders' advice and accept the payment associated with distribution A or reject the sender's advice and take the payment associated with distribution B. In making this decision, they receive has absolutely no other information. Finally, both to increase the simplicity of this environment and to match the methodology used for responders in the ultimatum game, the responders are asked to indicate whether they will accept the advice of the sender, which is a strategy elicitation method. In this context, accepting the advice of the sender can be interpreted as compliance or (blind) trust.

The senders' screen is shown in Figure 3 and the receivers' screen is shown in Figure 4 below.

Figure 3: The Sender's Screen

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Section 4

You and a randomly matched participant will receive one of two amounts for this portion of the experiment.

If Option A is selected you will receive $15 Lab dollars and they will receive $5 Lab dollars.

If Option B is selected you will receive $5 Lab dollars and they will receive $15 Lab dollars.

You do not select Option A or Option B Instead you must send one of two messages to the other participant who will then choose between the two options. The other participant will have no information about either Option A or Option B

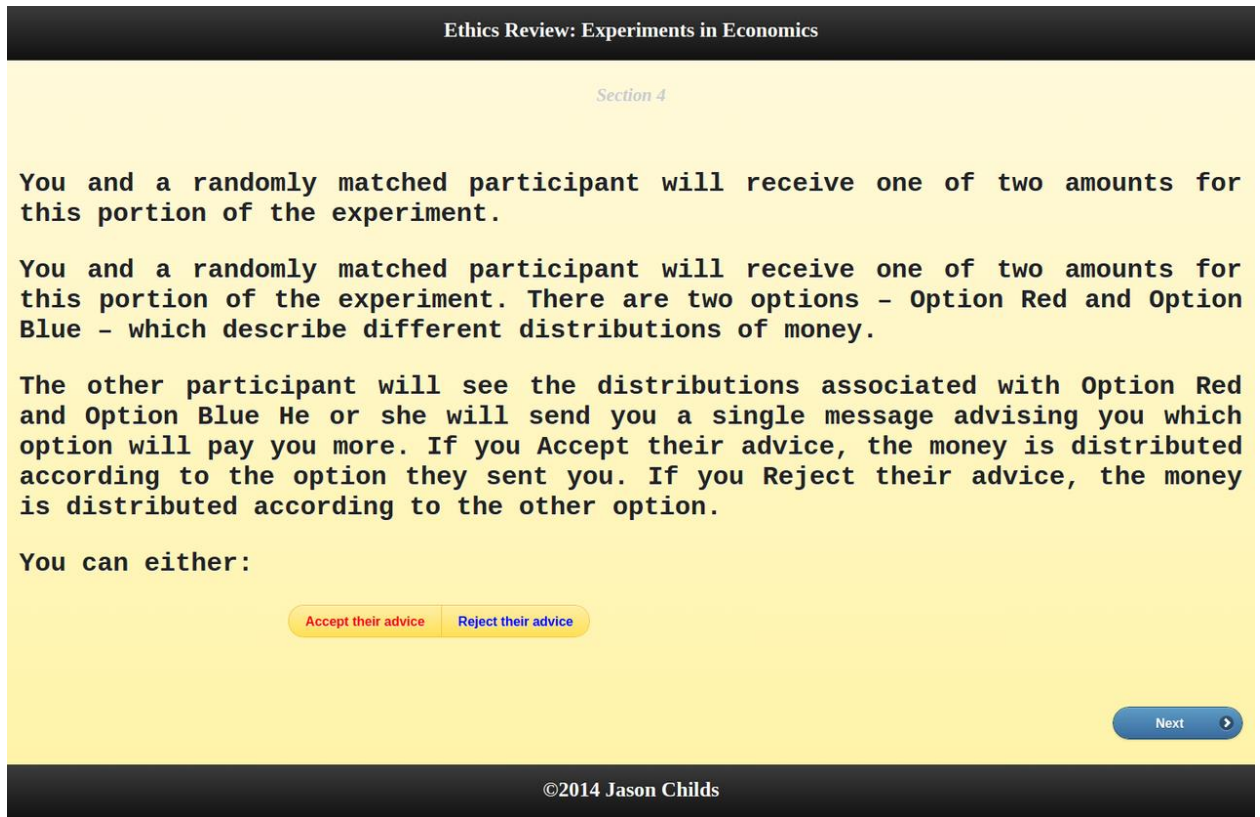Choose the message you will send to the other participant:

| Option A will pay you more money. | Option B will pay you more money. |

Next ➤

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Section 4

You and a randomly matched participant will receive one of two amounts for this portion of the experiment.

You and a randomly matched participant will receive one of two amounts for this portion of the experiment. There are two options – Option Red and Option Blue – which describe different distributions of money.

The other participant will see the distributions associated with Option Red and Option Blue He or she will send you a single message advising you which option will pay you more. If you Accept their advice, the money is distributed according to the option they sent you. If you Reject their advice, the money is distributed according to the other option.

You can either:

Accept their advice   Reject their advice

Next

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2.3 Prisoner's Dilemma Game

The prisoner's dilemma has one of the longest histories in game theory and experimental economics. One of the first experiments using the prisoner's dilemma, performed at the RAND corporation, was developed as a method to understand strategy in cold war politics (Flood, 1952). The prisoner's dilemma sets up a tension between the socially optimal and the individual optimal outcomes. The socially optimal (total payoff maximizing) outcome requires that all participants coordinate on a single action, however, each subject can improve their payoff by defecting from the cooperative action, thereby profiting at the expense of the group. Figure 5 below illustrates the simple two-by-two symmetric version of the game with neutral framing that was utilized in this analysis.

To simplify programming and exposition, all players saw the game as if they were "column" players. Being a symmetric game, this simplification should have had no impact on players' interpretation of the game.

2.4 Determining Risk Attitudes

Almost every economic decision involves a degree of risk and uncertainty. As such, attitudes toward risk affect virtually every economic decision. By way of illustration, people with a low risk tolerance, as shown by Bellante and Link (1981) and Dong (2017), are more likely to pursue careers in the public service, rather than embark on a career in the private sector or to start their own business.

In this experiment, the price-list method, developed by Holt and Laury (2002), is utilized to evaluate subjects' attitude toward risk. Specifically, subjects are presented with a series of paired lotteries. One lottery is always the same and has a very low variance in payoffs. The other lottery has a much greater dispersion of payoffs and differs in each case by the odds of the low payoff and the high payoff being realized. By switching from the low payoff dispersion lottery to the higher payoff dispersion lottery, the subjects indicate the boundary on their tolerance for risk. As well, one pair of lotteries was randomly selected for each subject and subjects were paid for the outcome of the lottery they chose. Although an imperfect measure of risk attitude, it does allow for identification of large scale differences between groups of subjects. A screen shot of this task is shown in Figure 6 below.

Figure 6: Screen Shown for Paired Lotteries

2.5 Time Preference Revelation

The ability to defer gratification is essential to making the kind of investments necessary for an improving standard of living—this is true at both the personal and societal levels. For example, the pursuit of education requires deferring current consumption as the majority of the cost to the student is not tuition costs, but the opportunity costs of forgone earnings. Likewise, at a societal level, the investment that supports the acquisition of new capital requires less current consumption in hopes of obtaining higher future incomes and consumption levels.

A price-list method is employed to determine each subject's ability to defer reward for one month. Specifically, a single case was selected at random for each subject and the subject was then paid based upon the option that they chose. If the subject chose a deferred payment, then they had to return to the experimenter in one month to receive payment. Figure 7 illustrates the screen shown to the subject when making his/her time preference decision.

2.6 Socio-demographic Survey

To facilitate additional analysis of the experimental results, a non-incentivized survey was utilized to collect data from the subjects of the experiment on a wide variety of personal characteristics. These characteristics were then controlled for in data analysis performed in this study. The basic information collected included, sex, age, marital status, family income by category, and employment status. The subjects were also asked to identify (via textbox) the culture with which they most identified and whether they grew up in an urban or rural environment. The subjects (that is, the students) were also asked to identify their current faculty or program of study. In addition, the students were asked to respond to a series of questions using Likert scales. In particular, they were asked three questions on feelings of belonging (either to Canada as a country, to the province in which they are attending university currently, and to their current university community). The subjects were also asked about their degree of happiness, life satisfaction, and how important their religion was to them. Finally, the subjects were asked how much they agreed with 4 statements based on Dahling, Whitaker, and Levy's New Machiallevianism Scale (Dahling, Whitaker, & Levy, 2009). These statements presented to the

students were: "It is acceptable to take advantage of another's weakness", "I enjoy being in control of situations", "Accumulating wealth in important", and "It is acceptable to sabotage others".

3. Results

This analysis involved 255 subjects (that is, students) at three separate universities located in three different Canadian provinces. The subjects completed the entire battery of experiments in a single sitting. There were 82 subjects in the experiments at the Social Science Research Laboratory at the University of Saskatchewan; 92 subjects who completed the experiment at the University of New Brunswick's Saint John campus; and 81 subjects participated in the experiments on the St. John's campus of Memorial University of Newfoundland. All subject participated using identical software, with identical instructions and incentives.

Table 1 summarizes the results of the socio-demographic survey that are used in the remainder of the analysis for each location. The sample of subjects appears to be reasonably similar in terms of their socio-economic and demographic characteristics across all three sample locations. 47% of the sample were male. This ranged from a low of 45% in Saskatchewan to 48% in the other two provinces. The average age of the subjects varied between 24 and 25 years across the three provinces. There was a noticeable difference in the proportion of the students who were married — 14.9% of the sample were married students, but only 7.4% of Newfoundland and Labrador sample were married, while 19.6% of the New Brunswick sample were married and 17.1% of the Saskatchewan sample were married. The diversity in family income was also noticeable across sample: the overall average family for the sample of students across all three provinces was $59,363, which ranged from a low of $53,668 in New Brunswick to a high of $65,244 in Saskatchewan, with students from Newfoundland and Labrador having an average family income of $59,877. Likewise, the employment status of the sample differed by province. With an average of 44.7% reporting employment, this ranged from a low of 35.8% for Newfoundland and Labrador students to a high of 54.9% for those students sampled from Saskatchewan and the New Brunswick sample indicated that 43.5% of the students were employed. The proportion of each sample that identified themselves as local were 62.7%, with a high of 76.5% in Newfoundland and Labrador, and a low of 54.9% in Saskatchewan. Table 1 also summarizes the responses to the various Likert scale questions. Self-reported happiness was very consistent across locations, with an overall average happiness of 3.14, with a low of 3.08 in Newfoundland and Labrador to a high of 3.17 in Saskatchewan. Unsurprisingly, self-reported life satisfaction follows a nearly identical pattern, with an overall average of 7.49 out of 10. There were also three questions relating to subject's sense of belonging. The average subject felt a fairly strong connection to their university campus, 2.85 of 4 overall. Ranging from 2.98 in New Brunswick to 2.77 in Newfoundland and Labrador. Students felt a high degree of belonging to the province in which their university was located; averaging 2.75 out of 4 overall. Belonging to Canada was notably higher than subjects' sense of belonging to a specific province, with an average 3.22 out of 4. The low of 3.06 in Newfoundland and Labrador is significantly different from the sense of belonging to Canada in the other provinces. Subjects were also asked to provide an estimate of the number of hours they spend volunteering in a month. Despite their generally weaker sense belonging, those in Newfoundland and Labrador provided more volunteer hours than those in New Brunswick and Saskatchewan; 2.86 versus 2.68 and 2.53 respectively. Subjects also reported how important their religion was to them on a scale of 1 to 4. The overall level of religious importance of 2.75, just below somewhat important.

Finally, subjects were asked to identify the degree to which they agreed with each of four statements designed to assess how Machiavellian they were. Machiavellianism is one of the basic "dark" traits identified in a growing body of psychology literature. Those who are Machiavellian are likely to place a higher value on personal payoffs at the expense of others. In general, subject were weakly averse to sabotaging the efforts of others as the average on that question was 2.20. There was little difference among average response, ranging from a low of 2.10 in New Brunswick to a high of 2.29 in Saskatchewan. Subjects reported enjoying controlling situations, with an average response of 4.03 out of 5. As with sabotage, there was a low dispersion of average response; 4.12 in Newfoundland and Labrador down to 3.92 in New Brunswick. Accumulating wealth was similarly popular, as the overall average response was 3.90, with the most motivated by money being in Newfoundland and Labrador (4.02) and the least in New Brunswick (3.82). Finally, subjects were asked if they felt it was acceptable to take advantage of the weakness of others; the average response was 2.94 with no meaningful differences among locations.

Table 1: Summary Statistics for the Socio-Demographic Survey

Variable	Type and Range	Saskatchewan	New Brunswick	Newfoundland and Labrador	Aggregate
Sex	Binary, Male=1	45%	48%	48%	47%
Age	Continuous 17 to 50	24.1	24.7	23.4	24.1
Married	Binary Married=1	17.1%	19.6%	7.4%	14.9%
Income	Categorical	$65,244	$53,668	$59,877	$59,363
Employment Status	Binary Employed=1	54.9%	43.5%	35.8%	44.7%
From Away	Binary Not Local =1	54.9%	57.6%	76.5%	62.7%
Happiness	Likert 1 to 5 1 = very unhappy	3.17	3.15	3.08	3.14
Life Satisfaction	Likert 1 to 10 1 = very unsatisfied	7.59	7.49	7.40	7.49
Belonging to Campus	Likert 1 to 4 1 = very weak	2.79	2.98	2.77	2.85
Belonging to Province	Likert 1 to 4 1 = very weak	2.83	2.77	2.64	2.75
Belonging to Canada	Likert 1 to 4 1= very weak	3.28	3.30	3.06	3.22
Volunteer Hours	Continuous	2.53	2.68	2.86	2.69
Religious Importance	Likert 1 to 4 1 = not important	2.71	2.78	2.74	2.75
Willing to Sabotage Others	Likert 1 to 5 1 = strongly disagree	2.29	2.10	2.23	2.20
Enjoy Controlling Situations	Likert 1 to 5 1 = strongly disagree	4.06	3.92	4.12	4.03
Accumulating Wealth	Likert 1 to 5 1 = strongly disagree	3.87	3.82	4.02	3.90
Taking Advantage of Weakness	Likert 1 to 5	2.93	2.97	2.91	2.94

Table 2 reports the results of the economic experiments in each location.

Table 2: Results from the Experiments

Action	Saskatchewan	New Brunswick	Newfoundland and Labrador	Aggregate
Ultimatum Offer $ out of $10	$6.30	$6.70	$6.90	$6.60
Minimum Acceptable Offer $ out of $10	$3.40	$4.40	$3.10	$3.70
Dictator Offer $ out of $10	$4.90	$5.20	$5.50	$5.20
Lied Inaccurate message = 1	NA	40%	56%	48%
Trust Accepted Advice = 1	78.0%	76.6%	95%	82.8%
Cooperator Socially Optimal Choice in Prisoner's Dilemma	51.2%	56.5%	55.6%	54.5%
Risk Attitude # of Safe Lotteries Selected out of a possible 10	4.4	4.0	3.7	4.0
Time Preference # of Immediate Payouts Selected out of a possible 15	6.9	6.6	6.6	6.7

In the ultimatum game, the average proposal offered was $6.60 out of a possible $10. This varied from $6.30 in Saskatchewan to $6.70 in New Brunswick and $6.90 in Newfoundland and Labrador. On the other hand, the average minimum acceptable offer by the responders averaged $3.70 out of a possible $10. When the dictator game was played, the average offer fell to $5.20 out of a possible $10. This offer ranged from an average of $4.90 in Saskatchewan to $5.20 in New Brunswick to $5.50 in Newfoundland and Labrador.

In the cheap-talk, sender-receiver game, 48% of the sample lied on average, with an average of 56% of the Newfoundland and Labrador sample lying and 40% on average of the New Brunswick sample lying. Due to a technical problem, there was no data on lying collected for Saskatchewan. For the receivers, an average of 82.8% of the sample trusted the information that they received and accepted the advice. This ranged from a high of 95% on average for the Newfoundland and Labrador sample to 78.0% on average for the Saskatchewan sample and 76.6% on average for the New Brunswick sample.

In the prisoner's dilemma game, 54.5% of the sample on average cooperated to achieve the socially optimal choice. This was similar across all three locations: 51.2% of the sample from Saskatchewan cooperated on average, 56.5% of the sample from New Brunswick cooperated on average, and 55.6% of the sample from Newfoundland and Labrador cooperated on average.

The risk attitudes of the sample was similar across all three locations, with an average of 4.0 safe lotteries selected on average. The corresponding results for each location on average were: 4.4 for Saskatchewan, 4.0 for New Brunswick and 3.7 for Newfoundland and Labrador.

The rates of time preference exhibited by the students in this sample were also similar and high across the sample, with 6.7 immediate payouts selected on average. The students from Saskatchewan chose 6.9 immediate payouts on average and the students from both New Brunswick and Newfoundland and Labrador chose 6.6 immediate payouts on average.

3.1 Identifying Significant Factors

The battery of experiments, naturally, created a plethora of data, much of which is potentially closely related. In order to reduce the number of variables and to focus our attention on fundamental relationships, primary component factor analysis (Gorsuch, 1983) with a varimax rotation was utilized to identify elements of both behaviour and socio-demographic characteristics driven by the same intrinsic or underlying element. Factor loadings are presented in Table 3 – to simplify exposition only the results for variables meaningfully associated with at least one factor are reported. Entries in bold indicate meaningful loadings on that factor. The variables with bold entries are thus assumed in the remainder of the analysis to be driven by the same factor[8].

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Table 3: Results from Component Factor Analysis

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Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Income	-0.0608	0.0121	-0.0369	0.1776	**0.7328**
Happiness	**0.7519**	0.1285	-0.0617	-0.0445	0.0956
Belong to Campus	0.2248	**0.6697**	-0.0568	-0.0015	-0.2170
Belong to Province	0.1287	**0.7737**	0.1791	-0.0712	0.0767
Belong to Canada	0.1245	**0.7821**	-0.0369	0.0519	0.0616
Volunteer Hours	**0.3773**	-0.0059	-0.0757	0.2200	-0.2815
Religious Importance	**0.4539**	0.1130	0.1759	-0.0104	-0.3091
Control	-0.0503	0.0067	-0.0114	**0.8558**	0.0764
Wealth	-0.1323	0.0341	-0.2278	**0.6946**	0.1814
Advantage of Others	0.0566	-0.2182	0.0574	**0.5109**	-0.2530
Time Preference	0.1856	-0.0205	0.0917	0.0842	**0.4688**
Life Satisfaction	**0.7929**	0.2632	-0.0170	-0.1211	-0.0415
Ultimatum Offer	-0.0876	0.2382	**0.8305**	-0.0452	-0.0349
Dictator Offer	0.0377	-0.1322	**0.8679**	-0.0651	**0.0105**

Names given to each the five factors with Eigen values above 1 (as recommended by Gorsuch (1983)) are assigned (somewhat arbitrarily) and are shown in Table 4.

<div align="center">

Table 4: Factors With Eigen Value Greater Than One

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Factor Name	Associated Variables
Goodlife	Happiness, Life Satisfaction, Religious Importance, Volunteer Hours
Belonging	Belonging to Campus, Belonging to Province, Belonging to Canada
Equitable	Ultimatum Offer, Dictator Offer
Machiavellian	Enjoy controlling situations, important to accumulate wealth, OK to take advantage of others
Money	Income, Time Preference

The values generated by Stata's factor predict procedure in place of variables with significant factor loadings, are used where appropriate, in the remainder of this analysis.

3.2 An Analysis of Ultimatum Offers

The first step in this analysis is to pool all of the data and then to identify the most appropriate econometric specification. This is done by utilizing both the vselect (Lindsey & Sheather, 2010) and gsreg functions of Stata. The vselect function allows for three methods of model selection, all based

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[8] In keeping with common practice for factor analysis, all variables are normalized.

maximizing the degree to which the model explains differences in the dependent variable; forward selection, backward selection, the Furnival-Wilson leaps and bounds selection. Forward selection and backward selection are both stepwise procedures, in which variables are added to or removed from the model one at a time to determine the impact each of the independent variables has on the ability of the model to explain the observed values of the dependent variable, only those independent variables that meaningfully add to the explanatory power of the model are retained. The Furnival-Wilson method organizes the potential models into different categories and then ignores the ones that clearly identified as suboptimal (Lindsey & Sheather, 2010). We also report models identified by the global search method (Gluzmann & Panigo, 2015). The global search approach, searches over all possible model specifications and reports the one that maximizes the ability of the model to explain the dependent variable. Differences in how variables are added to or removed from the model and in how explanatory power are measured can yield differences in the model specifications selected by these methods. As the choice between these methods often comes down to arbitrary judgements we report models identify by all four methods and leave it to the reader to choose between them where they differ. However, when all selection method identify similar relationships, these relationships are extremely likely to identify underlying relationships and not to be the result of quirks model specification. The same procedure is also employed on a data set composed only of subjects who identified as native to the province in which the experiments were conducted. The results of the regression analysis with ultimatum game offers as the dependent variable using the complete data set are shown in Table 5.

Table 5: Regression Results for Ultimatum Game by Selection Criteria – Complete Sample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Dictator Offer	0.5801***	0.5626***	0.5708***	0.5519***
Belonging	0.4426***	0.4420**	0.3454***	0.3429***
Goodlife	-0.1850*	-0.1870*	-0.1143**	-0.1167**
New Brunswick		-0.4926	-0.0227	
Newfoundland and Labrador		-0.4863	0.1092	
Come From Away	0.2926	0.2564	0.3520***	0.3688***
Cooperator				0.1581
R^2 Adjusted	0.4318	0.4335	0.4020	0.4086

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized. The equitable factor is excluded as is constructed using ultimatum offers themselves.*

As was implicit in the factor analysis, and is consistent with other interpretations, a key and a statistically significant predictor of offers in the ultimatum game is a subject's offer in the dictator game. Making a larger offer in the ultimatum game and in the dictator game is clearly driven, in part, by concern for others. As well, a generalized feeling of belonging is also an important and statistically significant predictor of higher offers in the ultimatum game. Concern for others (either directly or motivated by a sense of fairness) is intuitively linked to social distance. The weaker is a sense of belonging, the less concerned the subjects will be with others. Thus, a greater sense of belonging is significantly associated with more generous ultimatum offers.

Those who were living a "good life" also made higher offers in the ultimatum game. These people had higher levels of self-reported happiness, life satisfaction, religious importance, and volunteer hours.

Subjects from New Brunswick or Newfoundland and Labrador are not identified as making significantly different ultimatum offers than subjects in Saskatchewan, despite the variables being included in the regression by the backward selection and Furnival-Wilson selection algorithms.

Finally, subjects who self-identified themselves as coming from outside the province in which the universities hosting the experiments are located were notably more generous in the ultimatum game than their more local counterparts in all specifications and significantly so in two. This could be due to a higher degree of other regarding preferences or because they expect the average responder to be more demanding than locals do. The difference between the locals and those attending university in a specific location suggests that focusing the analysis only on locals or those identified as native to each respective province is in order, as one of the core objectives of this study is to identify potential differences between the populations of the three provinces.

To this end, the analysis next considers the behaviour of a subsample composed only of locals or subjects native to the province in which the experiments were conducted. This leaves much smaller sample of 95 subjects. The regression analysis results are shown in Table 6.

Table 6: Regression Results for Ultimatum Game by Selection Criteria – Locals Subsample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Dictator Offer	0.6048***	0.6048***	0.6048***	0.6048***
Belonging	0.2352**	0.2352**	0.2352**	0.2352**
Minimum Acceptable Offer	0.2298**	0.2298**	0.2298**	0.2298**
Newfoundland and Labrador	0.3979*	0.3979*	0.3979*	0.3979*
Married	-0.3206	-0.3206	-0.3206	-0.3206
Risk Attitude	0.1231	0.1231	0.1231	0.1231
Goodlife	0.1220	0.1220	0.1220	0.1220
R^2 Adjusted	0.3868	0.3868	0.3868	0.3868

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized. The equitable factor is excluded as is constructed using ultimatum offers themselves.*

The first significant observation is that all four model selection methods return the same specification, which is comforting. Once again, higher dictator game offers are associated with higher ultimatum offers, suggesting that both behaviours are influenced by regard for others in some capacity. The positive relationship between belonging and ultimatum game offers indicates that those who feel they belong are more likely to have regard for others positively. As with dictator game offers, demands made when acting as a dictator-game responder are predictive of higher offers when acting as ultimatum-game proposer.

Of particular interest in this set of regression results is that those students from Newfoundland and Labrador are more generous in the ultimatum game than those from either New Brunswick or Saskatchewan. Given that dictator game offers are already controlled for, and as shown below in the analysis of behaviour in the dictator game directly, this is not due to a higher degree of other regarding preferences. If higher ultimatum game offers are not driven by a greater concern for the welfare of others, they must be motivated by either an increase in the perceived likelihood of rejection or greater aversion to risking a rejection. As risk aversion was a potential regressor, but not found to add to the explanatory power of the model, we conclude the higher ultimatum offers made by students in Newfoundland and Labrador are motivated by a greater anticipation that responders in Newfoundland and Labrador rejecting low offers.

Overall, there is no statistically significant difference in behaviour of subjects in the three provinces, when students from outside the province are included in the sample. When these "come from aways" are excluded, subjects from Newfoundland and Labrador offer markedly more than those from either New Brunswick or Saskatchewan in the ultimatum game. This result indicates higher anticipated

demands from responders in Newfoundland and Labrador, since other regarding preference are controlled for with offers in the dictator game. However, those who are not local to a province make higher offers than those who are.

In both specifications, locals only and the complete sample, those who made high offers in the dictator game also made high offers in the ultimatum game. This behaviour indicates a high degree of other regarding preference. An individual's generalized sense of belonging is also highly predictive of ultimatum game offers. This may be emanating from an increased degree of other regarding preference.

The next step is to examine the minimum acceptable offers in the ultimatum game.

3.3 Minimum Acceptable Offer in the Ultimatum Game

By using the strategy elicitation method, subjects indicate whether they would accept or not each of the 10 possible ultimatum game offers. This can be used to identify the lowest offer that they would be willing accept. In the model proposed by Fehr and Schmidt (1999), higher minimum acceptable offers are driven by higher marginal disutility of disadvantageous inequality. As with ultimatum game offers, the next step involves an analysis of the pooled data and four different model selection criteria. The results are shown in Table 7.

Table 7: Regression Results for Minimum Acceptable Offers by Selection Criteria – Complete Sample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Goodlife	-0.4022***	-0.4022***	-0.3571***	-0.3571***
Money	0.2594**	0.2594**	0.1375**	0.1297**
Risk Aversion	-0.2330*	-0.2330*	-0.1976***	-0.1882***
Cooperator	0.2841	0.2841	0.1051	
New Brunswick	0.2494	0.2494	0.3927***	0.4109***
Married				-0.2779
R^2 Adjusted	0.1829	0.1829	0.1495	0.1563

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

Deviating from the habit of focusing discussion only on variables that have regression coefficient significantly different from zero, it is important to note that none of the behaviours in other games is associated with minimum acceptable offers. It seems the element of a subject's preferences that drives willingness to acceptable an ultimatum offer is not a factor in the other behaviours examined.

Those subjects who enjoy a high degree of happiness, higher life satisfaction, contribute hours of volunteer service, and find religion to be important are significantly less demanding when acting as responder in the ultimatum game. It may be people who score highly on this dimension are better able to endure unequal distributions. Those who score highly on the money dimension – that is, have low incomes and a lower ability to wait for a payoff – demand more than others in the ultimatum game. This result suggests a higher marginal disutility from inequality for this group. Unsurprisingly, risk aversion plays an important role in a subject's minimum acceptable offer. The more risk averse a subject was, the lower is the minimum they were willing to accept.

Finally, in two specifications, Furnival-Wilson and Global Regression Search, subjects in New Brunswick were more demanding than subjects from either Saskatchewan or Newfoundland and Labrador. The unwillingness to accept unequal distributions of found money has the potential to be a significant impediment to economic development and deserves further research.

In order to focus on those most likely to be representative of each province, the sample is also separated into those with a historic link to the province in which the sample is collected and those with links to other places. The results of the regression analysis on the locals only sample are shown in Table 8.

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Goodlife	-0.2823***	-0.2805***	-0.2805***	-0.2805***
Machiavellian	0.2593***	-0.2267**	-0.2267**	-0.2267**
New Brunswick	0.3906*	0.4001**	0.4001**	0.4001**
Money	0.1661*	0.1455	0.1455	0.1455
Risk Attitude	-0.1823*	-0.1729*	-0.1729*	-0.1729*
Dictator Offer		-0.2960	-0.2960	-0.2960
R^2 Adjusted	0.1917	0.2004	0.2004	0.2004

Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.

Of key interest is the consistent difference between subjects from New Brunswick and those from other provinces – on average New Brunswickers demand more as a minimum acceptable offer than those subjects from other places. Those subjects who scored higher for both the Machiavellian and money factors were also more demanding, while those who scored high on the good life scale were less demanding. As with the pooled sample, locals who were risk averse accepted lower minimum acceptable offers than others. That is, the higher the minimum acceptable offer, the greater the risk of receiving nothing in this part of the experiment. When acting as responders, subjects' only risk mitigation strategy is to reduce the minimum offer they will accept

The key finding of this analysis is that subjects from New Brunswick were more demanding when acting as responders in the ultimatum game than those from other places.

3.4 Dictator Game

The next step is to consider the behaviour of subjects in the dictator game. In this game subjects simply assign a portion of available funds to an anonymous partner (to be determined once all decisions have been made). In the dictator game, this anonymous partner has no ability to decline the offer, and must just take what is given. This game allows one to determine the degree of other regarding preferences of a subject, without concern for a possible rejection. There is no strategic element to behaviour in the dictator game.

The results of the regression analyses are shown in Table 9.

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Ultimatum Offer	0.5203***	0.5203***	0.5427***	0.5537***
Cooperator	0.5387***	0.5387***	0.3079***	0.3092***
Belonging	-0.2254**	-0.2254**	-0.2537***	-0.2632***
Risk Aversion	-0.1619	-0.1619	-0.0902	-0.1009*
Machiavellian	-0.1332	-0.1332	-0.0181	
Money	0.0132	0.0132	0.0526	
Married	0.3140	0.3140	0.4002**	0.4460***
Goodlife	0.1048	0.1048	0.0630	0.0684
Come From Away				-0.2584**
Employed				0.1167
Newfoundland and Labrador				0.1558

R² Adjusted	0.4356	0.4356	0.3817	0.3990

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

As with the analysis of ultimatum offers, there is a strong link between offers in the dictator game and offers in the ultimatum game as reflected in a statistically significant result across all four specifications. Behaviour in both games is highly dependent on the same element of other regarding preferences. Those who chose the cooperative action in the prisoner's dilemma, as shown by a statistically significant coefficient, were also more generous when imposing a distribution in the dictator game. Surprisingly, those who felt a stronger sense of belonging were statistically significant less generous dictators, indicating a potential association between belonging and entitlement. High levels of risk aversion were found to be weakly linked to lower dictator offers in only one specification and not statistically significant in the others.

In two of the specifications, married subjects were statistically significant, indicating that they were more giving than single subjects. This is consistent with the hypothesis that learning to live with another has a tendency to induce an increase in regard for others. In the specification identified by the global search regression, those from outside each province were less generous than locals, despite controlling for feelings of belonging.

None of the specifications indicate a meaningful difference among the attitudes of the people of these three provinces in terms of other regarding preferences. Given the importance of belonging in all four specifications and the significant coefficient associated with being from out of province suggests, once again, the analysis of only subjects native to each province is warranted. The results of this analysis for the local subsample are shown in Table 10.

Table 10: Regression Results for Dictator Game by Selection Criteria – Locals Subsample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Ultimatum Offer	0.5397***	0.5397***	0.5397***	0.5397***
Belonging	-0.2983*-**	-0.2983*-**	-0.2983*-**	-0.2983*-**
Married	0.7199***	0.7199***	0.7199***	0.7199***
Cooperator	0.2884*	0.2884*	0.2884*	0.2884*
Machiavellian	-0.1266	-0.1266	-0.1266	-0.1266
Rural	0.2498	0.2498	0.2498	0.2498
Male	0.2480	0.2480	0.2480	0.2480
R² Adjusted	0.4539	0.4539	0.4539	0.4539

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

It is interesting to acknowledge that all four model selection protocols return the same specification, indicating the appropriate model is being utilized. As with the analysis of the pooled data, those who made higher offers in the ultimatum game also made statistically significant and higher offers in the dictator game. A sense of belonging contributed to subjects making statistically significant and lower offers in the dictator game, even among those who were native or local to a province. This implies that belonging and entitlement may be linked. Local subjects who were married were markedly more generous than single subjects. And finally, cooperators were more generous than those who opted for the individually optimal action in the prisoner's dilemma, suggesting that cooperation is linked to regard for others.

There is no meaningful difference among the three provinces from which the samples were drawn in terms of other regarding preferences revealed through offers in the dictator game.   In short, there is no

reason to believe that there is a meaningful difference in the degree of other regarding preference in terms of generosity toward others across all three provinces.

3.5 Willingness to Lie and Blind Trust

Half of the subjects were given the opportunity to lie to an anonymous partner in the cheap-talk, sender-receiver game, with a reward of $10 if their lie was believed. Due to an error in the software, data was not accurately collected for senders in Saskatchewan. Because only half of subjects were assigned to each role, the sample was not divided into locals and those from elsewhere.

The global regression search method was used to identify the most appropriate probit model specification for the remaining data, based on two fit criteria: the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC).   The results of this analysis are shown in Table 11 below.

Table 11: Results for Selecting the Best-Fitting Probit Model

Variable	Global Search – AIC	Global Search - BIC
Machiavellian	0.3427**	0.3311**
Money	0.3506**	
Canadian	-0.8546**	
Married	-0.9319**	
Probability > χ^2	0.0024	0.0181

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

As neither of the location dummy variables are retained by the model selection process, we can conclude there is no difference in the likelihood of someone lying based on whether they're in New Brunswick or Newfoundland and Labrador. However, it is statistically significant that those who scored highly on the Machiavellian factor were more likely to send an inaccurate message (that is, to lie). The same is true of those who scored highly on the Money factor.   Keep in mind that the Money factor included both family income and time preference, with those who declined higher payoffs in the future in favour of a current $5 payoff receiving a higher score on the Money factor. Hence, the payoff from honesty is likely long term, while the benefits from lying tend to be more immediate, entirely consistent with those who struggle to delay gratification being more likely to lie. Subjects who identified as Canadian were statistically significantly less likely to lie than their international counterparts. Finally, those who were married were statistically significantly less likely to lie.

The subjects who were not given the role of sender in the sender-receiver game played the role of receiver. They had to indicate if they would accept or reject the advice of the sender. If they accepted the advice of the sender, this choice is interpreted as blind trust because the receivers have no other information about the environment beyond the message received from the sender.

The global regression search procedure was used to identify the best fitting probit specification based on the AIC and the BIC. The results are shown in Table 12.

Table 12: Results for Selecting the Best-Fitting Probit Model

Variable	Global Search – AIC	Global Search – BIC
Risk Attitude	0.2669*	
Newfoundland and Labrador	0.8592**	0.8693**
Equitable	0.5208***	0.3882**
Minimum Acceptable Offer	-0.2339	
Probability > χ^2	0.0024	0.0041

Subjects in Newfoundland and Labrador were statistically significantly much more likely to trust the anonymous message than subjects in either Saskatchewan or New Brunswick. This occurs despite subjects from Newfoundland and Labrador being no less likely to lie (after controlling for other factors). The source of this naiveté is unknown currently, but certainly warrants further research in this area.

Those who scored highly on the Equitable factor (that is, those who made high dictator and ultimatum offers) were also likely to be trusting. Trust may therefore be linked to other regarding preferences. Finally, risk aversion was weakly related to the likelihood of trusting the anonymous message.

3.6 Cooperation

All subjects completed a one shot prisoner's dilemma with an anonymous partner. This simple game can be distilled down to a simple decision, cooperate and pursue the socially optimal payoff or defect and pursue the individually optimal payoff. The global regression search methodology is utilized to identify the most appropriate probit regression to explain the likelihood of an individual subject choosing take the cooperative action. The results are shown in Table 13.

Table 13: Results for Selecting the Best-Fitting Probit Model for the Prisoner's Dilemma – Complete Sample

Variable	Global Search – AIC	Global Search – BIC
Equitable	0.4112***	0.2890**
Age	0.1736	
Probability > χ^2	0.0000	0.0459

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

The only variable in the data set that has an important and statistically significant effect on the decision to cooperate in the prisoner's dilemma is equitable behaviour, as defined by the subject's offers in the ultimatum and dictator games. Those who made higher offers in these games, indicating a higher degree of other regarding preferences, were markedly more likely to choose to cooperate.

The behaviour of local subjects is also considered in isolation. The results of this analysis are shown in Table 14 below.

Table 14: Results for Selecting the Best-Fitting Probit Model for the Prisoner's Dilemma – locals Subsample

Variable	Global Search – AIC	Global Search – BIC
Newfoundland and Labrador	-1.2109***	-0.8696**
Married	-1.4589**	
Age	0.8088**	
Equitable	0.3645**	0.3491**
Money	0.2917*	
Probability > χ^2	0.0021	0.0078

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

Subjects local to Newfoundland and Labrador (while sampled in Newfoundland and Labrador) were much more likely to opt for the individually optimal rather than the cooperative strategy than local subjects in both New Brunswick and Saskatchewan, as evidenced by the statistically significant negative coefficient on the Newfoundland and Labrador dummy variable. This is despite a higher degree of trust among Newfoundland and Labrador subjects in the cheap-talk, sender-receiver game. Surprisingly, given their greater generosity in the dictator game, married subjects were less likely to opt for the

socially optimal action in the prisoner's dilemma. Older subjects were more likely than younger ones to choose the cooperative strategy. Those local subjects who made more generous offers in the ultimatum and dictator games were also more likely to opt for the cooperative strategy. As stated before, these results suggest a link between other regarding preferences and cooperative behaviour. Thus, concern for social optimal outcomes is likely linked to other regarding preferences. Finally, and surprisingly, these results suggest there is a positive link between the Money factor (income and willingness to delay a payoff) and choosing the cooperative action in the prisoner's dilemma.

3.7 Time Preference

The elicitation of time preference involves no strategic interaction, just a choice under uncertainty. Using the simple price-list method to get a sense of each subject's ability to defer a monetary reward, one finds that the more often a subject opts for an immediate payoff instead of an increasing deferred payoff, the less able they are to defer gratification. The ability to defer gratification differs among subjects, not only by geographic region, but by other behaviours and characteristics as well. To this end, a linear regression analysis is conducted and the results of which are reported in Table 15 below.

Table 15: Regression Results for Time Preference by Selection Criteria – Complete Sample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Goodlife	0.2442***	0.2442***	0.2442***	0.2445***
Minimum Acceptable Offer	0.1442**	0.1442**	0.1442**	0.1433**
Income	0.1158*	0.1158*	0.1158*	0.1330**
Male	0.3102**	0.3102**	0.3102**	0.2990**
Employed	0.1522	0.1522	0.1522	0.1769
Equitable	0.0849	0.0849	0.0849	
Come From Away	-0.1769	-0.1769	-0.1769	
New Brunswick	-0.1578	-0.1578	-0.1578	
Saskatchewan				0.2007
R² Adjusted	0.0852	0.0852	0.0852	0.0863

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

In interpreting these results, the relatively low predictive power of any of the model specification suggests there are important variables which determine a subject's ability to defer gratification that were not measured is the current experiment. That said, however, several characteristics appear to be related to the ability to wait for a reward that should be included in future research. Those who scored highly on the Goodlife factor also required a greater inducement to wait for payment.   The same is true of family income (the Money factor is not included as the time preference metric is a component of constructing it). Thus, demanding higher offers in the ultimatum game were less able to defer gratification than thus more accepting of low ultimatum offers. Finally, males were less able to defer gratification than females.

Next, consider only those local to the university at which the experiments were conducted. The results are in Table 16.

Table 16: Regression Results for Time Preference by Selection Criteria – Locals Subsample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Minimum Acceptable Offer	0.3930***	0.3930***	0.3930***	0.3930***
Goodlife	0.3025**	0.3025**	0.3025**	0.3025**
Male	0.3560*	0.3560*	0.3560*	0.3560*

Employed	-0.2720	-0.2720	-0.2720	-0.2720
Cooperator	0.2266	0.2266	0.2266	0.2266
R² Adjusted	0.1516	0.1516	0.1516	0.1516

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

Once again, there is no meaningful difference among the three provinces as none of the provincial dummy variables are chosen by any of the model selection procedures, while the goodness of fit is actually improved, despite the smaller sample.

As with the pooled data, greater demands, when acting as a responder in the ultimatum game, are associated with preferences for payment now versus higher payments later.   Those with high values on the Goodlife factor were also impatient. Local males continue to struggle to defer gratification.

3.8 Risk Attitude

Next, the simple Holt and Laury (2002) price-list method is utilized to assess each subject's attitude toward risk. Given that the concern is not with the specific degree of risk aversion or with determining a risk element of a utility function, it is only necessary to simply count the number of times subjects opt for a low payoff variance lottery. The more "safe" lotteries chosen, the more risk aversion the subject. A linear regression analysis was performed for individual risk attitudes for our entire sample and for a subsample composed only of those subjects from the same province as each of the universities in which the experiments were conducted That is, locals). The results of the regression analysis using the entire data set are shown in Table 17.

Table 17: Regression Results for Individual Risk Attitudes – Complete Sample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Married	0.9353***	0.8267***	0.3096*	0.3164*
Goodlife	-0.1730**	-0.2153**	-0.2520***	-0.2495***
Come From Away	-0.3095*	-0.3030	-0.2548*	-0.2401*
Strategy	0.1344*			
Equitable	-0.1179	-0.1028	-0.1319**	-0.1359**
Money	0.1057	0.1195	0.1195*	0.1208*
Employed		-0.2083	-0.0619	
Belonging		0.1060	0.1375**	0.1377**
R² Adjusted	0.2022	0.1950	0.1381	0.1414

*Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.*

Married subjects consistently opted for a greater number of safe lotteries than those who were single. While those who scored highly on the Goodlife factor (that is, happiness, life satisfaction, religion, volunteering) were less risk averse than those with lower scores. Those who were not native to the provinces in which their experimental sessions were conducted were also more tolerant of risk. This is unsurprising, as attending university far from home, perhaps in another country, involves a higher level of risk than studying closer to home. The strategy variable captures the degree to which a subject increased their offer in the ultimatum game over what they offered in the dictator game. The more a subject increased their offer in the ultimatum game, the greater the number of safe lotteries they chose. Interestingly, those who scored highly on the Equitable (dictator and ultimatum offers) factor were less risk averse than those who made lower offers in those games. Those who scored highly on the Money (income and inability to wait) were less tolerant of risk than others. Finally, those with a greater sense of belonging were more risk averse than those who felt themselves to be outsiders.

The importance of the "come from away" variable make considering the behaviour of only those native to the province in which the experiments were being conducted is advisable. The results of the regression analysis using only the local subjects are shown in Table 18.

Table 18: Regression Results for Individual Risk Attitudes – Locals Subsample

Variable	Forward Selection	Backward Selection	Furnival-Wilson	Global Search
Married	0.6381**	0.6381**	0.6381**	0.6381**
Goodlife	-0.2453**	-0.2453**	-0.2453**	-0.2453**
Machiavellian	0.1906*	0.1906*	0.1906*	0.1906*
Money	0.1547	0.1547	0.1547	0.1547
Minimum Acceptable Offer	-0.1831	-0.1831	-0.1831	-0.1831
New Brunswick	0.1954	0.1954	0.1954	0.1954
R^2 Adjusted	0.1184	0.1184	0.1184	0.1184

Notes: * indicates significant at 10% level, ** at the 5%, and *** at the 1% level. All non-binary variables have been normalized.

Once again, there is no statistically significant difference in subjects' risk aversion among provinces, as the New Brunswick dummy was the only one chosen by the model selection process and it is not statistically significant. There is no evidence to suggest that university students local to Saskatchewan, have different attitudes toward risk from those local to either New Brunswick or Newfoundland and Labrador. There are several variables that do contribute to explaining the dispersion of attitudes toward risk. Local subjects who were married were significantly more risk averse than single subjects. Higher levels of Machiavellianism was also associated with a higher degree of risk aversion. On the other hand, subjects who with high Goodlife scores were more willing to take risks than other subjects.

Conclusion

This paper reports the results of an economic experiment that contributes to the literature in two key ways. First, subjects completed a battery of simple economic experiments (ultimatum game, dictator game, cheap-talk sender-receiver game, prisoner's dilemma, time preference, and risk attitude) and a socio-demographic survey so that consistencies in behaviour across situations can be detected, while simultaneously controlling for potentially relevant personal characteristics. Second, data was collected on behaviour in this battery of economic experiments in three distinct regions of the same country – Saskatchewan, New Brunswick, and Newfoundland and Labrador. The primary objective of this approach was to search for differences in preferences (as revealed through behaviour) among these regions. Despite the fact that Canada is often seen as culturally and institutionally homogeneous, there were differences in behaviour among students in multiple games.

Several elements of the data set were collapsed using principal-component factor method. This approach identified and enabled the construction of values for 5 separate factors that explained multiple variables on the collected data. While the labeling of factors is always arbitrary, the label these five factors was based on the loadings of the key variables associated with each. The Goodlife factor hinges on four different variables from the socio-demographic survey— happiness, life satisfaction, religion, and volunteer hours. The factor analysis method used suggests that each of these elements are not truly independent, but driven by the same unobserved personal characteristic. The Belonging factor

captures subjects' feelings of belonging with reference to three levels— belonging their university, belonging to the province in which the university is located, and their feeling of belonging to Canada. Offers in the ultimatum and dictator games are combined to give us the Equitable factor. Machiavellianism is computed from the degree to which subjects agree to three propositions— enjoying controlling situations, it is important to accumulate wealth, and it is acceptable to take advantage of another's weakness. The final factor included in this analysis is labeled the Money factor, which is dependent upon household income and the subject's inability to defer gratification.

Consistent with factor analysis, offers in the dictator game are excellent predictors of offers in the ultimatum game and vice versa. This is entirely in keeping with Fehr and Schmidt (1999), Bolton and Ochenfels (2000), or even Andreoni (1995); each of which assert that preferences make reference to the relative standing of others. Subjects in this experiment were clearly concerned with outcomes received by the anonymous other in the dictator and ultimatum games. The fact that the minimum that the same subjects were willing to accept when acting as a responder (with a different anonymous partner) in the ultimatum game lends support to the basic premise underpinning Fehr and Schmidt (1999) – that subjects treat advantageous inequality differently from disadvantageous inequality.

Risk aversion was only a weak predictor of other decisions in our sample. Risk averse subjects demanded marginally less when acting as a responder in the ultimatum. The strategy elicitation method was used to identify the lowest offer subjects would accept. Stating that they would reject an offer was a decision that came with an uncertain payoff. Greater risk aversion is associated with a higher likelihood of blind trust in our cheap-talk sender-receiver game, suggesting that accepting advice from others in this situation is a default and opting for something different is seen as the risky alternative.

Attitudes toward others as captured by the Machiavellian factor appears to be a surprisingly weak predictor of behaviour in the battery of experiments conducted, only having a statistically significant relationship with minimum acceptable ultimatum offers among the local subjects and lying for a financial gain. It was not important in ultimatum or dictator offers. Nor were those high on the Machiavellian factor any less likely to opt for the cooperative strategy in the prisoner's dilemma. Thus, Machiavellianism shows up as a consistent type of behaviour (answers to the un-incentivized questions), but appears to play little role in most of the economic behaviour we examine in this study.

The feeling of belonging was captured by the Belonging factor. It is positively associated with offers in the ultimatum game, but negatively associated with offers in the dictator game. This suggests a higher degree of strategic thinking among those who feel they belong.

The factors dubbed Goodlife (happiness, life satisfaction, religious importance, and volunteer hours) was the factor with the most explanatory power in our experiments. The Goodlife factor was positively associated with ultimatum (but not dictator) offers and the inability to defer gratification (time preference). It was negatively associated with demands in the ultimatum game and risk aversion. The Belonging factor, how strongly a subject felt they belonged to their university, province, and Canada, was positively associated with ultimatum offers,

The analysis found statistically significant behavioural differences in four different situations. Subjects from Newfoundland and Labrador were different from New Brunswickers and from those in Saskatchewan in making higher ultimatum game offers, a greater likelihood of trusting an anonymous message, and being less likely to choose the cooperative strategy in the prisoner's dilemma. New

Brunswickers were made significantly higher demands when acting as the responder in the ultimatum game. These differences appear even after controlling for a wide variety of personal characteristics and behaviours.

For those instances in which no difference is found, it is eminently possible that the sub-population from which the sample is drawn is much more homogeneous than the underlying populations. Those who choose to attend university and volunteer to participate in economic experiments in different regions may have more in common with each other than with the general population of the university's home province. As is typically the case, the lack of evidence of a difference should not be confused for evidence of no difference.

Clearly, additional research is needed to explore the differences in behaviour by province we identify and ascertain any other differences that may exist among the broader populations of these provinces.

References

Andreoni, J. (1995). Warm-Glow versus Cold-Prickle: The Effects of Positive and Negative Framing on Cooperation in Experiments. *Quarterly Journal of Economics* , 1-21.

Bellante, D., & Link, A. (1981). Are Public Sector Workers More Risk Averse Than Private Sector Workers? *Industrial and Labor Relations Review*, 408-412.

Bjornskov, C. (2012). How Does Social Trust Affect Economic Growth? *Southern Economic Journal*, 1346-1368.

Bolton, G., & Ochenfels, A. (2000). A Theory of Equity, Reciprocity, and Competition. *American Economic Review*, 166-193.

Brandts, J., & Charness, G. (2011). The Strategy versus Direct-Response Method: A First Survey of Experimental Comparisons. *Experimental Economics*, 375-398.

Childs, J. (2012). Gender Differences in Lying. *Economics Letters*, 147-149.

Coller, M., & Williams, M. (1999). Eliciting Individual Discount Rates. *Experimental Economics* , 107-127.

Dahling, J., Whitaker, B., & Levy, P. (2009). The Development and Validation of a New Machiavellianism Scale. *Journal of Management*, 219-257.

Dean, M., & Ortoleva, P. (2016). Is It All Connected? A Testing Ground for Unified Theories of Behavioral Economics Phenomena. *Working Paper*.

Dong, H. (2017). Individual Risk Preference and Sector Choice: Are Risk-Averse Indivduals More Likely to Choose Careers in the Public Sector? *Administration & Society*, 1121-1142.

Dreber, A., & Johannesson, M. (2008). Gender Differences in Deception. *Economic Letters*, 197-199.

Fehr, E., & Schmidt, K. (1999). A Theory of Fairness, Competition, and Cooperation. *Quarterly Journal of Economics* , 817-867.

Flood, M. (1952). *Some Experimental Games.* Santa Monica, CA: RAND Corporation. Retrieved from https://www.rand.org/pubs/research_memoranda/RM789-1.html

Forsythe, R., Horowitz, J., Savin, N., & Sefton, M. (1994). Fairness in Simple Bargaining Experiments. *Games and Econoimc Behavior*, 347-369.

Gluzmann, P., & Panigo, D. (2015). Global search regression: A new automatic model-selection technique for cross-section, time-series, and panel-data regressions. *Stata Journal*, 325-349.

Gneezy, U. (2005). Deception: The Role of Consequences. *American Economic Review*, 384-394.

Gorsuch, R. (1983). *Factor Analysis, 2nd Edition .* Hillsdale, NJ: Lawrence Erlbaum Associates.

Guth, W., & Schwarze, B. (1982). An Experimental Analysis of Ultimatum Bargaining. *Journal of Economic Behavior & Organization*, 367-388.

Holt, C., & Laury, S. (2002). Risk Aversion and Incentive Effects. *American Economic Review*, 1644-1655.

Kahneman, D., Knetsch, J., & Thaler, R. (1990). Experimental Tests of the Endowment Effect and the Coase Theorem. *Journal of Political Economy*, 1325-1348.

Lindsey, C., & Sheather, S. (2010). Variable Selection in Linear Regression. *The Stata Journal*, 650-669.

Oosterbeek, H., Sloof, R., & Van de Kuilen, G. (2004). Cultural Differences in Ultimatum Game Experiments: Evidence from a Meta-Analysis. *Experimental Economics* , 171-188.

Thaler, R., & Sunstein, C. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness.* New Haven, CT: Yale University Press.