University of Alberta

The Connected Customer:
Essays on Individualistic-Collectivistic Decision-making

by

Rickard Enström

A thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Marketing

School of Business

Spring 2010
Edmonton, Alberta

Examining Committee

Dr. Terry Elrod, School of Business, University of Alberta

Dr. Adam Finn, School of Business, University of Alberta

Dr. Joffre Swait, School of Business, University of Alberta

Dr. Yuanfang Lin, School of Business, University of Alberta

Dr. Wiktor Adamowicz, Department of Rural Economy, University of Alberta

Dr. Dilip Soman, Rotman School of Management, University of Toronto

Dedication

This dissertation is dedicated to the loving memory of my mother, Ulla Elisabet Enström (born Dahlberg), 19 March 1937 – 7 April 2009, Stockholm, Sweden.

Abstract

The traditional approach to the study of consumer behaviour is to regard them as isolated islands of preferences, needs, motives, and goals; however, this approach neglects the impact of 'others' on consumers' judgments and preferences. For this reason, the theme of this thesis is the 'connected customer'.

Chapter 2 and 3 provides a theoretical and empirical treatment of a situation often encountered in households: how do an individual's private risk preferences translate into preferences over risk when making decisions on behalf of a group of people in which the decision-maker is a member? It is hypothesized that the decision-maker's degree of altruism and perception of the group members' risk preferences are the driving forces in the relation between private and social risk preferences. The results suggest that social preferences can be characterized as a mixture of individuals' private risk preferences and the beliefs-private risk differential.

Chapter 4 looks at individuals' information processing strategy under conditions of low and high cultural salience. Recent findings suggest that consumers in both individualist and collectivist cultures use a dual processing approach—a heuristic versus a systematic processing strategy—when assessing product alternatives. However, collectivist members tend to rely more on consensus information than attribute. This chapter examines whether priming individuals on their cultural identity will make them to switch processing strategy toward consensus information and hence become more similar to collectivist members. The results largely support this prediction.

Acknowledgements

I could not have completed this dissertation without the support of many people. First, I would like to thank my committee, Terry Elrod, Adam Finn, Joffre Swait, Yuanfang Lin and the external examiners Vic Adamovicz, and Dilip Soman for being part of this and providing input to my research. In particular, I am indebted to my advisor Terry Elrod, who introduced me to the wonderful world of Bayesian modeling and who always provided unfailing support. Furthermore, I am indebted to Adam Finn, who encouraged me to join the Marketing PhD program, and who provided invaluable guidance to me. I would like to acknowledge the profound impact of Vic Adamovicz, who introduced me to experimental economics. As a PhD student, I appreciated the support of David Cooper, Jeanette Gosine, Kathy Harvey, Ed Martineau, and Laura Jackson. Moreover, I am grateful to Joseph Doucet and Ken Schultz for serving on my candidacy committee. I would like to pay special gratitude to Chris and Viveka Janssen for support. Financial assistance offered by the University of Alberta and Swedbank is greatly appreciated. Long conversations with my sister Cecilia Enström-Öst regarding the hardship of PhD studies provided comfort.

Last, I would like to express my dearest thanks to my parents Göran and Ulla Enström, Sweden. Your unconditional love, support, and concern provided me with everything I could ever have wanted for life. When I write these words it is exactly one year since my mother passed away. It was my mother's dream to see me graduate, and I know that she would have been very happy for me today.

Mamma, you will always be in my thoughts and in my heart.

Table of Contents

List of Tables

List of Figures

Chapter 1

Introduction

Social scientists have traditionally treated consumers as isolated islands of preferences, needs, motives, and goals. This setup results in a parsimonious model of the 'consumer', but as a scientific model it is unsatisfactory since it ignores the impact of 'others' on consumers' judgment and preferences. For this reason, the theme of this thesis is the 'connected customer'.[1] The adjective 'connected' could be interpreted in several ways: it could refer to other-regarding preferences such as philanthropy (or on the negative side misanthropy); it could mean the way information is transferred and recognized among individuals; it could entail memberships in ad hoc groups but also naturally formed groups spanning from households to cultures; and it could cover various other aspects of social identity. In addition, individuals are often put in situations where they have to make decisions or give advice that affects others. For example, in the household context, many decisions affecting all household members are often only made by a subset of the household members.

The purpose of this thesis is to develop a clearer understanding of some of the consequences of being 'connected'. All three papers in this thesis deal with implications of group membership on judgment and decision-making and a common theme is 'risk', as in the trade off between uncertainty and expected outcome. In particular, Chapter 2

[1] In the 2006-2008 research priorities of the Marketing Science Institute (MSI) the 'Connected Customer' was announced as an emerging theme in the contemporary marketing environment (http://www.msi.org/pdf/MSI_RP06-08.pdf). The emphasis, however, is on the development of communication technologies such as mobile telephony, online special-interest groups and other online social venues. These communications technologies facilitate and enhance group- and social-network effects on consumer behaviour. In the subsequent research priorities of the MSI, 'Understanding Consumer/Customer Behaviour' was pointed out as one of the six top research priorities (http://www.msi.org/pdf/MSI_RP08-10.pdf).

provides a theoretical treatment of a society characterized by uniform altruism among individuals. Through a system of interdependent utility functions the link between individual preferences over private risk and individual preferences over social risk is established. It is hypothesized that individuals' level of altruism, group-size and beliefs on others' risk preferences are the driving forces in the link between private and social risk preferences.

Chapter 3 provides a counterpart to Chapter 2 by empirically investigating to what extent and how individuals' private preferences on trade-off between uncertainty and expected outcome translate into preferences for trade-off when making a choice on behalf of others, as in multi-person households. Consumers encounter these situations on a daily basis when they choose among product and service alternatives. The units of measurement could embrace time, as when choosing among transportation means; levels of product or service quality; or money, as in when choosing among insurance packages. Individuals' risk preferences are investigated under two distinct settings: (1) the decision-maker is solely affected by the outcome, private risk preferences; and (2) the individual and a group of people for whom he makes a decision are affected, social risk preferences.[2] The empirical examination is based on responses to a series of lotteries with real monetary outcomes according to the Holt-Laury format (Holt and Laury 2002).

[2] The term 'social risk' does not come without problems unfortunately. For example, social risk is often used in the context of embarrassment, losing face, and peer approval (Mandel 2003). However, it has also been used in the setting of various risks for society at large, such as discussions regarding the welfare state (Mares 2003). Given the experimental design in situation (2), 'social risk preferences' could also be called the 'random dictator's risk preferences', or 'proportionality risk preferences'. The terms 'group risk preferences' and 'collective risk preferences' seemed less than useful as they could be interpreted as the aggregate risk preferences of groups and societies exhibited in unanimous group decisions or through voting. Given the literature review and classification of fairly disparate studies investigating some aspects of private and group/social/collective risk, 'social risk' seemed to be the most appropriate common denominator. Hence, 'social' here refers to decisions involving and/or affecting others.

Empathy is treated as an antecedent state of altruism in accordance with the empathy-altruism hypothesis (Batson et al. 1991) and is measured through the interpersonal reactivity index (Davis 1983; Davis 1980). Chapter 3 also provides an extensive literature review of earlier research on private versus social risk preferences and a classification schema of the experimental setup in these studies.

Chapter 4 considers the effect of salient cultural group membership on information processing strategies. It has been shown that individuals use a dual processing approach when making judgments under uncertainty; a heuristic versus a systematic processing strategy (Chaiken 1980). The former is described as less effortful processing where more accessible information is used, whereas for the latter, individuals wield appreciable cognitive efforts actively assessing arguments given in messages. New research shows that consumers in both individualist and collectivist cultures use this dual processing approach (Aaker and Maheswaran 1997). Yet, when the heuristic cue and the systematic information are incongruous, members of individualist cultures rely more on attribute information than members of collectivist cultures. Recently it was also shown that when members of individualist cultures were made aware of their cultural identity, they recalled their cultural group membership and made choices exhibiting similar concerns as members of collectivist cultures (Briley and Wyer 2002).

Chapter 4 integrates and builds upon these findings by examining whether or not priming individualist members on their cultural identity will cause them to switch processing strategies so that the difference between individualist and collectivist cultures in this respect is mitigated. Participants' information processing strategies are investigated by asking them to evaluate a new digital camcorder using either product attributes or the opinions of others. In the cultural salience high condition, individuals

are asked to identify important Canadian objects and events in pictures. For the cultural salience low condition, individuals are instead shown pictures of Chinese cultural icons. Social risk is here interpreted as the risk of deviating from the norm of society established through the salient cultural group membership.

References

Aaker, Jennifer L. and Durairaj Maheswaran (1997), "The effect of cultural orientation on persuasion," Journal of Consumer Research, 24 (3), 315-28.

Batson, C. Daniel, Judy G. Batson, Jacqueline K. Slingsby, Kevin L. Harrell, Heli M. Peekna, and R. Matthew Todd (1991), "Empathic joy and the empathy-altruism hypothesis," Journal of Personality and Social Psychology, 61 (3), 413-26.

Briley, Donnel A. and Robert S. Wyer, Jr. (2002), "The effect of group membership salience on the avoidance of negative outcomes: Implications for social and consumer decisions," Journal of Consumer Research, 29 (3), 400-15.

Chaiken, Shelly (1980), "Heuristic versus systematic information processing and the use of source versus message cues in persuasion," Journal of Personality and Social Psychology, 39 (5), 752-66.

Davis, Mark H. (1983), "Measuring individual differences in empathy: Evidence for a multidimensional approach," Journal of Personality and Social Psychology, 44 (1), 113-26.

---- (1980), "A multidimensional approach to individual differences in empathy," JSAS Catalog of Selected Documents in Psychology, 10 (85).

Holt, Charles A. and Susan K. Laury (2002), "Risk aversion and incentive effects," American Economic Review, 92 (5), 1644-55.

Mandel, Naomi (2003), "Shifting selves and decision making: The effects of self-construal priming on consumer risk-taking," Journal of Consumer Research, 30 (1), 30-40.

Mares, Isabela (2003), The Politics of Social Risk: Business and Welfare State Development. Cambridge: Cambridge University Press.

Chapter 2

Linking Private and Social Risk Preferences

2.1 Introduction

Considerable evidence from real life and the laboratory shows that individuals from time to time behave in manners that benefit others. These actions include, but are not limited to, gift-giving, charitable donations, contributing to public goods, and a general aversion to inequity. The explanations for these other-regarding preferences range from social and cultural norms, fairness, guilt, reciprocity to altruism, among others.

When linking private and social risk preferences it is hypothesized that interdependent utility functions, generated through social interactions among altruistic individuals, is the driving force. Under appropriate assumptions, the system of interdependent utility functions induces a unique and stable system of independent utility functions. This system is the basis for the derivation of the link between individuals' private and social risk preferences.

2.2 Uniform altruism and preferences over social risk

Interdependent utility systems have been studied by among others Becker (1981; 1974), Bergstrom (1989a; 1989b; 1993; 1999), and Bramoullé (2001). For the present purpose a specific form of interdependent utilities is considered, as featured in for example Bergstrom (1999) and Bramoullé (2001). These interdependent utilities imply that individuals not only pay attention to others' private preferences but also to their social preferences and hence exhibit non-paternalistic altruism.

Let N denote the set of all individuals in the group and assume that N is finite with cardinality $|N|=n$. Furthermore, let X_i represent the consumption set for individual i and let X denote the Cartesian product describing the possible allocations of each element x_i in X so that $X = X_1 \times \cdots \times X_n = \{(x_1, x_2, ..., x_n) \mid x_i \in X_i,\ i = 1, 2, ..., n\}$. For each individual $i \in N$, let $N_{\sim i}$ represent the set of all other individuals in the group. Each individual i is said to have a private subutility function $u_i : X_i \to \Re$ describing their self-regarding preferences, which is perfectly known to themselves and a collective utility function such that $U_i(x) : \Re^{|N|} \to \Re$. No other assumptions are made on the shape of the private subutility functions other than that they are continuous and twice differentiable with $u_i'(x_i) > 0,\ \forall i \in N$. Let i's perception of the state of happiness of each other individual $j \in N_{\sim i}$ be denoted $W_{ij}(x)$. It is assumed that an individual's perception of another individual's state of happiness is an estimator of their true preferences so that

(1) $$W_{ij}(x) = \hat{U}_j(x).$$

Hence expression (1) captures that individuals might not be perfectly informed on others' utility functions.[1] An individual's collective utility function can hence be written as $U_i(x) = \boldsymbol{\Omega}(u_i(x_i), \hat{\mathbf{U}}_{\sim i}(x))^t$, where $\boldsymbol{\Omega} = (1, \omega, ..., \omega)$ is a $1 \times n$ row vector representing the individual's group welfare function. Assuming strong separability of preferences, i's collective utility function becomes

[1] See also Footnote 3.

(2) $$U_i(x) = u_i(x_i) + \omega \sum_{j \neq i} \hat{U}_j(x).$$

Thus, the system of $|N|$ intragroup interdependent utility function can be written as

(3) $$\left[I - \Omega\right]\mathbf{U} = \mathbf{u},$$

where I is the $n \times n$ identity matrix, Ω is the $n \times n$ altruism matrix, $\mathbf{U}$ is the $n \times 1$ vector of the group members' collective utility functions, and $\mathbf{u}$ is the $n \times 1$ vector of private subutility functions. Individuals' collective utility functions can then be expressed as independent functions of private subutilities by

(4) $$\mathbf{U} = \left[I - \Omega\right]^{-1}\mathbf{u}.$$

The above system induces a unique and stable system of independent utility functions over private subutilities for all $i \in N$ provided $\left[I - \Omega\right]$ is a dominant diagonal matrix with all *n* row sums being positive (Bergstrom 1999). Hence, for *n* group members, the restriction is $0 \leq (n-1)\omega < 1$.[2] The resulting system of independent utility functions has

[2] This condition is equivalent to the p-contraction property of multidimensional fixed point systems and ensures existence, uniqueness, and stability of the solutions to a fixed point system (Bramoullé 2001).

the diagonal elements equalling $\frac{(1-(n-2)\omega)}{(1-(n-1)\omega)(\omega+1)^{(n-2)}}$ and the off-diagonal elements equalling $\frac{\omega}{(1-(n-1)\omega)(\omega+1)^{(n-2)}}$. Hence,

$$(5) \qquad \mathbf{U} = \eta \begin{bmatrix} 1 & \frac{\omega}{(1-(n-2)\omega)} & \frac{\omega}{(1-(n-2)\omega)} & \cdots & \frac{\omega}{(1-(n-2)\omega)} \\ \frac{\omega}{(1-(n-2)\omega)} & 1 & \frac{\omega}{(1-(n-2)\omega)} & \cdots & \frac{\omega}{(1-(n-2)\omega)} \\ . & . & . & \cdots & . \\ \frac{\omega}{(1-(n-2)\omega)} & \frac{\omega}{(1-(n-2)\omega)} & \frac{\omega}{(1-(n-2)\omega)} & \cdots & 1 \end{bmatrix} \mathbf{u},$$

where $\eta = \frac{(1-(n-2)\omega)}{(1-(n-1)\omega)(\omega+1)^{(n-2)}}$ is positive and hence immaterial for inducing the same preferences over allocations.[3] Using the Arrow-Pratt measure of absolute risk-aversion (Arrow 1965; Pratt 1964) individual *i*'s collective risk-aversion coefficient, R_A^i, becomes

$$(6) \qquad R_A^i = -\frac{U_i''}{U_i'} = -\frac{u_i'' + \frac{\omega}{1-(n-2)\omega}\sum_{j\neq i} u_j''}{u_i' + \frac{\omega}{1-(n-2)\omega}\sum_{j\neq i} u_j'}.$$

[3] Note that even if individuals are not perfectly informed on others' preferences, the system is still p-contracting with the solution given above as long as $0 \leq (n-1)\omega < 1$. An interesting consequence is that individual *i* will have some beliefs about individual *j*'s social utility, and act accordingly, which will likely be different from individual *j*'s real social utility and the same will hold from individual *j*'s point of view. Hence, even if individuals will make errors in the assessment of others' preferences, one can still study whether they act according to their beliefs or not.

The restriction for a dominant diagonal matrix implies $0 \le \omega < l(n-1)^{-1}$, where $0 \le l < 1$. Hence, *i*'s collective risk-aversion can be written as a function of *i*'s private marginal utility and curvature and the average of the other group members' marginal utilities and curvatures

$$(7) \qquad R_A^i = -\{\frac{u_i''}{u_i' + \frac{l}{1-l\varphi}\overline{u}_{\sim i}'} + \frac{\frac{l}{1-l\varphi}\overline{u}_{\sim i}''}{u_i' + \frac{l}{1-l\varphi}\overline{u}_{\sim i}'}\},$$

where $\varphi = \frac{(n-2)}{(n-1)}$. From expression (7) one can learn that with increasing group size, while holding altruism constant, *i* will put more weight on others' risk preferences relative to his own preferences.[4] Note further that for very large groups, *i*'s collective risk-aversion looks like

$$(8) \qquad R_A^i = -\frac{u_i'' + \frac{l}{1-l}\overline{u}_{\sim i}''}{u_i' + \frac{l}{1-l}\overline{u}_{\sim i}'} = -\frac{u_i''(1-l) + l\overline{u}_{\sim i}''}{u_i'(1-l) + l\overline{u}_{\sim i}'}.$$

[4] This result might seem baffling at first. However, note that individual *i*'s collective utility function according to equation (2) is $U_i(x) = u_i(x_i) + \omega\sum_{j \ne i}\hat{U}_j(x)$. The *n* group members' collective utility functions can be expressed as one unique system of independent functions of private subutilities if $0 \le (n-1)\omega < 1$. This restriction implies that $0 \le \omega < \frac{1}{n-1}$ and $n > 1$. Hence, with increasing group size the range of possible altruism tightens. Another way of saying this is that the interpersonal altruism cannot be too strong in order to arrive upon one unique system of independent functions of private subutilities.

When *i* is completely selfish, *i*'s collective risk preference becomes $R_A^i = r_A^i$. On the other hand, when altruism among the group members is strong, *i*'s social risk preference becomes

$$(9) \qquad R_A^i(l=1) = -\frac{u_i'' + (n-1)\bar{u}_{\sim i}''}{u_i' + (n-1)\bar{u}_{\sim i}'}.$$

Thus, for large groups and strong altruism, *i*'s social risk preference will essentially not be influenced by his private risk preferences and $R_A^i \approx \bar{r}_A^{\sim i}$. Note further that with increasing altruism, any two individuals *i* and *j* in *N* will tend to become more similar in their social risk preferences. This is easy to show by using expressions (2) and (7) and writing *i*'s social risk-aversion coefficient as the identity

$$(10) \qquad R_A^i = -\frac{u_i'' + \frac{l}{1-l\varphi}\bar{u}_{\sim i}''}{u_i' + \frac{1}{1-l\varphi}\bar{u}_{\sim i}'} = -\frac{u_i'' + \frac{l}{n-1}\{\sum_j (u_j'' + \frac{l}{1-l\varphi}\bar{u}_{\sim j}'')\}}{u_i' + \frac{l}{n-1}\{\sum_j (u_j' + \frac{l}{1-l\varphi}\bar{u}_{\sim j}')\}}.$$

Hence, the stronger the altruism among the individuals in the group, the more weight the decision maker will put on the beneficiaries' social risk aversion coefficients and hence become more similar to them in this respect. The change in *i*'s risk-aversion coefficient when going from a private to a social decision task is

$$(11) \qquad \Delta r_i = R_A^i - r_A^i = \psi(\bar{r}_A^{\sim i} - r_A^i),$$

where

$$(12) \qquad \psi = \frac{\bar{u}_{\sim i}' l}{u_i'(1 - l\varphi) + \bar{u}_{\sim i}' l},$$

and $0 \le \psi < 1$. Note that ψ is increasing in altruism, but can be concave, linear or convex, depending on group size, and the marginal utilities of *i* and the average other person as

$$(13) \qquad \frac{\partial \psi}{\partial l} = \frac{\bar{u}_{\sim i}' u_i'}{\{u_i'(1 - l\varphi) + \bar{u}_{\sim i}' l\}^2} > 0$$

and

$$(14) \qquad \frac{\partial^2 \psi}{\partial l^2} = \frac{2\bar{u}_{\sim i}' u_{\sim i}'(\varphi u_i' - \bar{u}_{\sim i}')}{\{u_i'(1 - l\varphi) + \bar{u}_{\sim i}' l\}^3} \begin{cases} > 0, \text{ if } u_i' > \dfrac{\bar{u}_{\sim i}'}{\varphi} \\ = 0, \text{ if } u_i' = \dfrac{\bar{u}_{\sim i}'}{\varphi} \\ < 0, \text{ if } u_i' < \dfrac{\bar{u}_{\sim i}'}{\varphi} \end{cases}.$$

With regards to group size, ψ is increasing and concave as

(15) $$\frac{\partial \psi}{\partial n} = \frac{l^2 \bar{u}_{\sim i}' u_i' \frac{1}{(n-1)^2}}{\{u_i'(1 - l\frac{n-2}{n-1}) + \bar{u}_{\sim i}' l\}^2} > 0$$

and

(16) $$\frac{\partial^2 \psi}{\partial n^2} = \frac{\frac{2l^2 \bar{u}_{\sim i}' u_i'}{(n-1)^3}\{u_i'(l-1) - \bar{u}_{\sim i}' l\}}{\{u_i'(1 - l\frac{n-2}{n-1}) + \bar{u}_{\sim i}' l\}^3} < 0 .$$

From expression (11) follows that when *i* is completely selfish his risk preferences will not be altered when going from a private to a social decision task. Note further that *i*'s risk preferences will not change if he believes that the average other group member has the same risk preferences. A special case is when the average other group member is risk-neutral. For this case the change is simply $\Delta r_i = -\psi r_A^i$. Hence, if *i* is risk loving, the change will be positive and *i* will exhibit a social risk aversion coefficient that is $(1-\psi) > 0$ away from risk neutrality on the risk-loving side. On the other hand, if *i* is risk averse, the change is negative and *i* will be $(1-\psi) > 0$ away from risk neutrality on the risk-averse side. According to expression (11) an individual will always maintain the sign of the risk-aversion coefficient in his social decision task if he believes that the average other person has the same sign. Finally, a risk loving (risk averse) individual will become risk averse (risk loving) in a social decision task if he believes that the

average other person is risk averse (risk loving) and $|\overline{r}_A^{\sim i}| > |r_A^i|$.[5] Hence, under conditions of uniform altruism one may form the following hypotheses:

H1: Completely selfish individuals will not change their risk preferences when going from a private to a social decision task.

H2: Altruistic individuals who believe that the average other group member has the same private risk-preferences will exhibit social risk preferences that equal their private risk preferences.

H3: Altruistic individuals who believe that the average other group member has less risk-loving private risk preferences will exhibit social risk preferences that are more risk-averse than their private risk preferences.

H4: Altruistic individuals who believe that the average other group member has more risk-loving private risk preferences will exhibit social risk preferences that are more risk-loving than their private risk preferences.

H5: With increasing altruism the changes according to H3 and H4 will be greater, ceteris paribus.

[5] It might be tempting to deem these hypotheses as tautologies or analytical statements. However, 'Altruistic individuals will account for others' risk attitudes' is not a tautology but rather a synthetic statement. In contrast, 'Either altruistic individuals will account for others' risk attitudes or not' constitutes an analytical statement. The synthetic statement is empirically testable, but not the analytical statement (Hunt 2002).

H6: With increasing group size the changes according to H3 and H4 will be greater, ceteris paribus.

H7: With increasing altruism among group members, the group variance of social risk-aversion coefficients will decrease.

2.3 Summary and discussion

This chapter takes a look at the theoretical properties of the link between individuals' private and social risk preferences in a society with uniform altruism. It is established that when the uniform altruism among the individuals in society becomes stronger, individuals will become more similar in their social risk preferences. Moreover, the change in risk preferences from a private to a social decision task can be described as the difference between the average beneficiary's private risk preferences and the benefactor's private risk preferences. The parameter for this difference is increasing in altruism, but can be concave, linear or convex depending on the number of members in society, and the marginal utilities of the beneficiaries and the benefactor. Furthermore, the parameter is increasing and concave in group size.

In a future study some of the assumptions will be relaxed. In particular, the theoretical properties of the link between private and social risk preferences will be investigated for a society with non-uniform altruism.

2.4 References

Arrow, Kenneth J. (1965), Aspects of the Theory of Risk-Bearing. Helsinki: Yrjö Jahnsson Foundation.

Becker, Gary S. (1981), "Altruism in the family and selfishness in the market place," Economica, 48 (189), 1-15.

---- (1974), "A theory of social interactions," Journal of Political Economy, 82 (6), 1063-93.

Bergstrom, Theodore C. (1989a), "A fresh look at the rotten kid theorem - and other household mysteries," Journal of Political Economy, 97 (5), 1138-59.

---- (1989b), "Love and spaghetti, the opportunity cost of virtue," Journal of Economic Perspectives, 3 (2), 165-73.

---- (1993), "A survey of theories of the family," in Handbook of Population and Family Economics, Mark R. Rosenzweig and Oded Stark, Eds. 1 ed. Vol. 1: Elsevier.

---- (1999), "Systems of benevolent utility functions," Journal of Public Economic Theory, 1 (1), 71-100.

Bramoullé, Yann (2001), "Interdependent utilities, preference indeterminacy, and social networks," Department of Agricultural and Resource Economics, University of Maryland.

Hunt, Shelby D. (2002), Foundations of Marketing Theory: Toward a General Theory of Marketing. Armonk, New York: M. E. Sharpe.

Pratt, John W. (1964), "Risk aversion in the small and in the large," Econometrica, 32 (1-2), 122-36.

Chapter 3

Private and Social Risk Preferences: An Economic Experiment

3.1 Introduction

Uncertainty reigns in society and consumers' attitudes and feelings toward this regime is a steering factor for frequently occurring phenomena such as favouring brand name products, becoming brand loyal, purchasing insurances, and spending time on information searches and product comparison. The significance of attitudes toward uncertainty for consumer behaviour is clearly reflected in the large number of studies devoted to the topic in the social sciences over the last two decades. Numerous studies have emphasized individual decision-making, where a person's private risk preference is inferred. Likewise, unanimous group decision-making is well investigated, but most studies on groups' risk preferences are not incentive compatible as they present a range of findings from responses to hypothetical scenarios.

While individual decisions regarding private outcomes and decisions under unanimity are accurate characterizations of decisions made in singular households and committees they do not always properly depict the situation in multi-person households. Within this category it is not uncommon that individual household members on occasion make decisions that affect the entire household. In fact, Anglo-American studies published between 1956 and 1988 show that approximately half of all multi-person household decisions are made by one of the partners alone (Kirchler and Hofmann 2006).[1] A challenging issue is therefore the delineation of the process by which

[1] See also Davis (1976).

preferences for private risk are transformed into individual preferences for group/social risk under incentive compatible conditions. This issue has not yet been resolved. A number of intriguing research questions arise: Would the decisions elicit risk preferences that merely reflect the decision maker's private risk preferences, meaning that he is ignorant toward others' preferences? If not, what is the motive behind the differential? Is it a manifestation of the decision maker's attempt to internalize the assumed preferences of others? Moreover, will changing the group size change the outcome?

Individual preferences regarding private risk and social risk are revealed through consequential choices with real monetary outcomes for two group sizes. Altruistic preferences are elicited by having participants completing a scale measuring dispositional empathy.

The remainder of this chapter is organized in the following way: Section 3.2 first presents a brief literature review on some principal findings with regards to 'Risk and consumer behaviour' (3.2.1), followed by 'A typology of choice' (3.2.2), 'Defining risk' (3.2.3), 'Common utility functions and their properties' (3.2.4), some results from the experimental literature on 'Private risk preferences' (3.2.5), a review of the literature on 'Private versus social risk preferences' (3.2.6), and finally 'Altruism' (3.2.7). Section 3.3 presents the experimental design with regards to 'The elicitation procedure for risk preferences' (3.3.1) and 'The elicitation procedure for altruistic preferences' (3.3.2). Finally, section 3.4 presents the 'Experimental results' and section 3.5 concludes with a 'Summary and discussion'.

3.2 Literature review

3.2.1 Risk and consumer behaviour

A topic that has received substantial attention in the marketing/consumer literature is the impact of risk perceptions on consumer behaviour. Risk perceptions correspond to individuals' personal beliefs of both probabilities of outcomes and the outcomes themselves. At a higher level, these measures can explain why people are more likely to search for more information or alternatives before they make a purchase decision, and why individuals become brand loyal and also why some people are more likely to adopt new products and services in the market place.

Srinivasan and Ratchford (1991) presented a structural equation model of search effort for consumer durables and investigate to what extent perceived risk and perceived benefits have an impact upon the search effort.[2] The results suggest that perceived risk is proportional to the size of the evoked set of brands, knowledge is negatively related to perceived risk, and perceived risk is proportional to the perceived benefits of search efforts. Similarly Dowling and Staelin (1994) found a significant effect of perceived risk on information searches. Shimp and Bearden (1982) investigated how warranty quality and warranty reputation affects consumers' perceptions of the risks in the financial and performance domains. The findings suggest that consumers regard high-quality warranties as sufficient means of cancelling out financial risks and, hence, they serve as a risk-reducing mechanism. Low-quality warranties, on the other hand, have a limited value for the consumer. For example, consumers are sometimes given the option of purchasing extended service contracts on top of the warranty. Padmanabhan and Ram

[2] Perceived risk is defined as the probability of a loss from the limited search effort. The loss is financial, performance, physical or convenience.

(1993) set up a structural model of a monopolist offering warranties for consumers with heterogeneous risk-preferences. The consumer's problem is to decide whether or not to purchase the product and the level of warranty to purchase. Using data from purchases of extended service contracts by new car buyers, it was found that risk-averse consumers purchase these extended service contracts to a greater extent.[3]

Marketers can also reduce consumers' perceived risk by investing in the branding of a product. This holds in particular for consumers who are making their first purchase in a product category. Several different interpretations on the antecedents of the added value a brand yields to a product has been presented. For instance, Aaker (1991) and Keller (1993) traced the root of brand equity back to consumers' awareness of the brand and the associations the brand triggers in their minds. Risk-aversion of consumers new to a product category might lead them to consider the major brand first, with little effort spent on investigating the lesser known brands. However, with increasing category experience consumers are more likely to collect additional information on other, lesser known brands, which will eventually result in a preference for the brand yielding the highest utility (Heilman, Bowman, and Wright 2000).

Another interpretation of brand equity stems from information economics. In a market characterized by consumers that are not fully informed and buyers who are less informed than sellers, brand equity is rooted in the credibility of the brand (Erdem and Swait 1998). The main difference between the two approaches is that in the former approach, the decrease in perceived risk is caused by the brand equity, whereas in the

[3] Lutz and Padmanabhan (1995) showed that risk-averse customers purchasing extended service contracts are also likely to engage in consumer moral hazard by reducing maintenance of durable products. This imposes a cost externality for the manufacturer, which leads him to only offer a minimal manufacturer base warranty.

latter approach, brand equity is caused by a decrease in perceived risk owing to the level of credibility in the buyer-seller interaction. Subsequent research in the signalling domain has shown that with increasing credibility a brand is more likely to be considered by consumers: consumers perceive brands with higher credibility as less risky which affects consumer choice; perceived risk can explain choices on store brands versus national brands; and credibility brands provide more value to high-uncertainty-avoidance consumers because such brands have lower perceived risk and information costs (Erdem and Keane 1996; Erdem and Swait 2004; Erdem, Swait, and Valenzuela 2006).

Risk perceptions on new brands could potentially be affected by the price of the product, but the moderating effect of price upon risk aversion has not been shown to be consistent in the research. Peterson and Wilson (1985) suggested that consumers expect a positive correlation between price and quality, and hence a higher price reduces their perceived risk on product performance for new brands. Others, however, have found little or no effect of price on risk perception such as in Shimp and Bearden (1982) and White and Truly (1989). These inconclusive findings have been attributed to the fact that message framing and source credibility have not been controlled for (Grewal, Gotlieb, and Marmorstein 1994). Specifically, the relationship between price and perceived performance risk was found to be stronger when the accompanying advertising message is framed in the loss domain whereas in the positive domain there is essentially no impact of price upon perceived performance risk. In addition, the credibility of the message source is found to result in a greater negative relative relationship between price and perceived performance risk. For instance, Morris et al. (1994) investigated the important link between risk perception and risk-taking by looking at alcohol use and perceived risks of alcohol use by pregnant women. The degree of perceived risk is found to be the most

important discriminator between drinkers and non-drinkers with drinkers perceiving alcohol use during pregnancy as less risky.

A common belief in the psychology literature is that humans house several selves or identities. These selves may have different motives, goals, and preferences. Two selves that have been studied are the independent and the interdependent selves (Singelis 1994; Trafimow, Triandis, and Goto 1991; Ybarra and Trafimow 1998). The former self is more attuned to being unique and taking a 'do-it-yourself approach' to matters, whereas the interdependent or the collective self fosters harmony among peers (Markus and Kitayama 1991). In a recent study Mandel (2003) showed that people are more willing to take financial risks when their interdependent self is salient, but less willing to take social risks where the consequence might be that of losing face. In the financial domain, the result can be explained by the cushion hypothesis; individuals that were primed on the interdependent self were able to identify more friends and relatives who could potentially help them out in a financial crisis. At the same time, however, individuals are made aware of close relatives and friends which might remind them about the social risks.

3.2.2 A typology of choice

When making a decision, people choose between alternatives for which the outcomes depend upon factors that are outside their control. Together these external factors constitute 'states of nature'. A special case occurs when the decision-maker knows with certainty which of the states will prevail: this situation is labelled as choice under certainty. Unfortunately, most choice tasks do not have this property, but are rather choice under conditions of non-certainty. Within choice under non-certainty, the choice

task can be further categorized as being one of either choice under risk or choice under uncertainty. This distinction was first made by Knight (1921) who proposed that a choice under risk occurs when the set of outcomes for all alternatives have objectively known probabilities, whereas a choice under uncertainty occurs when at least one of the alternatives has probabilities that are ambiguous or only partly known.[4] Luce and Raiffa (1957) have suggested an additional category covering conditions under complete ignorance. The choice conditions are summarized in Table 3-1.

Table 3-1

Classification of choice conditions

CHOICE UNDER CERTAINTY	CHOICE UNDER NON-CERTAINTY
CERTAINTY – Deterministic knowledge	RISK – Complete probabilistic knowledge
	UNCERTAINTY – Partial probabilistic knowledge
	IGNORANCE – No probabilistic knowledge

For decisions under uncertainty, the analysis assumes that individuals make choices as if they held probabilistic beliefs of the outcomes (Savage 1954). Savage's work depends on the idea that the decision-maker has a coherent and complete set of probabilistic beliefs. Essential to this process is the 'sure-thing principle'; for any choice task where one of the outcomes is common across alternatives for the same state of

[4] Unfortunately, the terminology is not standardized. For instance, Tellis and Gaeth (1990) and Einhorn and Hogarth (1986) define three different levels of information: certainty, uncertainty, and ambiguity. Their definition of uncertainty and ambiguity corresponds to risk and uncertainty, respectively.

nature, the choice should not be altered if only the common outcome is changed. Allais (1953) challenged this finding by showing that respondents violate their own subjective probabilities and the 'sure-thing' principle. Furthermore, when Ellsberg (1961) presented subjects with two sequential choices, one risky and one uncertain, it was found that the subjective probabilities and preference order revealed in the first choice were not maintained in the second choice, implying an uncertainty-aversion. This is the starting point for the 'Knightian decision theory' (Bewley 2002). Gilboa and Schmeidler (1989) suggest that the Ellsberg paradox can be resolved by recognizing that subjects have insufficient information to form priors for probabilities. Since decision makers are uncertainty-averse, a set of priors are considered where the minimal expected utility are taken into account; maxmin expected utility.

In choice under risk, the expected utility from choosing a lottery L with N states is

$$(1) \qquad U(L) = \sum_{n=1}^{N} u_n \pi_n \,,$$

where u_n is the Bernoulli utility and π_n is the probability of each state *n* to occur. This is the von Neumann-Morgenstern expected utility function (von Neumann and Morgenstern 1944) which has a number of important properties including being unique up to a positive affine transformation without imposing any restrictions on the functional form of the Bernoulli utility function; however, for practical purposes, it is often assumed that the Bernoulli utility function is continuous and increasing in *x*. Therefore, a decision maker is said to exhibit risk-averse preferences if

(2) $U(L) < u(X(L))$,

where $u(X(L))$ is the utility of the expected outcome $X(L) = \sum_{n=1}^{N} x_n \pi_n$. Equation (2) is also Jensen's inequality which holds for any concave function.

3.2.3 Defining risk

As the von Neumann-Morgenstern expected utility is unique up to an affine transformation, Arrow (1965) and Pratt (1964) developed an approximation of risk-aversion based on the curvature of the utility function that is invariant to affine transformations. If an individual's initial wealth is ω and the certainty equivalent of any prospect that the individual considers is *M*, then the final wealth *W* is

(3) $W = \omega + M$.

The corresponding Bernoulli utility function is $u(W) = u(\omega + M)$. Given a twice continuously differentiable utility function with a positive first derivative, the absolute risk-aversion is

(4) $$r_A = -\left[\frac{\frac{\partial^2 u(\omega+M)}{\partial M^2}}{\frac{\partial u(\omega+M)}{\partial M}}\right] = -\left[\frac{\frac{\partial^2 u(W)}{\partial W^2}}{\frac{\partial u(W)}{\partial W}}\right] = -\left[\frac{\frac{\partial^2 u(\omega+M)}{\partial \omega^2}}{\frac{\partial u(\omega+M)}{\partial \omega}}\right],$$

where r_A denotes the coefficient of absolute risk aversion. The inverse of equation (4) expresses an individual's risk tolerance in monetary terms,

$$(5) \qquad t_A = \frac{1}{r_A(M)} = -\left[\frac{\frac{\partial u(\omega + M)}{\partial M}}{\frac{\partial^2 u(\omega + M)}{\partial M^2}} \right].$$

The coefficient of relative risk aversion is instead

$$(6) \qquad r_R = W r_A,$$

with the corresponding risk-tolerance t_R being the inverse of equation (6). A partial relative risk-aversion measure has been introduced by Zeckhauser and Keeler (1970), and Menezes and Hanson (1970). It is defined as

$$(7) \qquad r_{PR} = -M \left[\frac{\frac{\partial^2 u(\omega + M)}{\partial W^2}}{\frac{\partial u(\omega + M)}{\partial W}} \right].$$

This measure delineates the trajectory of a decision-maker whose wealth is unchanged, but in which the scale of the prospect *M* changes. From equation (3) one can learn that the partial relative risk aversion in equation (7) equals the relative risk aversion for zero wealth.

There have been several claims made that even modest levels of small-stakes risk-aversion leads to obscene large-stakes risk-aversion levels (Camerer and Thaler 2003; Kahneman 2003; Rabin and Thaler 2001). In response, Cox and Sadiraj (2006) introduced a utility function where wealth and income enter in a non-additive way. They developed a two-argument measure of risk aversion

$$(8) \qquad r_A^* = -\left[\frac{\partial^2 u(\omega, M)}{\partial M^2} \Big/ \frac{\partial u(\omega, M)}{\partial M} \right],$$

where M stands for the certainty equivalent of the prospect and ω represents the wealth, which is fixed. It is shown that the proposed Bernoulli utility function does not result in implausible large-stakes risk-aversion levels.

A decision maker can be classified according to how an increase in wealth affects his risk-aversion. Accordingly, an individual is said to exhibit increasing absolute risk aversion (IARA) if he turns more risk-averse with increasing wealth. If his risk aversion is constant for increasing levels of wealth, he exhibits a constant absolute risk-aversion (CARA). With decreasing absolute risk aversion (DARA), he instead becomes less risk-averse with increasing wealth. The general expression for the effect of wealth upon risk aversion can be straightforwardly derived from equation (4)

$$(9) \qquad \frac{\partial r_A(x)}{\partial x} = \frac{(u''(x))^2 - u'''(x)u'(x)}{(u'(x))^2}.$$

The sign of the numerator in equation (9) indicates the type of risk aversion, but the 'ability' of equation (9) to express the three different types of risk-aversion is restricted by the class of utility functions assigned to the decision-maker. From equation (9), however, one can see that for decreasing absolute risk aversion, it is required that

$$(10) \qquad \frac{\partial r_A(x)}{\partial x} < 0 \Leftrightarrow u'''(x)u'(x) > (u''(x))^2 .$$

Instead of evaluating the impact of wealth on individuals' risk aversion, one can express it as the impact of wealth upon risk-tolerance (Wilson 1968). Using equation (4) and (5), the individual's absolute cautiousness becomes

$$(11) \qquad \frac{\partial t_A(x)}{\partial x} = \frac{u'(x)u'''(x) - (u''(x))^2}{(u''(x))^2} .$$

Pratt (1964) distinguished between measures of risk-aversion in the 'small' and risk aversion in the 'large'. As all risk aversion measures presented above are based on the local curvature at the point x under the Bernoulli utility function, this is the risk-aversion in the 'small'. Pratt showed that a certain risk aversion in the 'small' determines the risk aversion in the 'large'. In addition, there is a certain amount of money that is associated with the individual's risk-aversion in the 'small' that makes him indifferent to the utility from a gamble and the utility from the certain money. If $\tilde{x}$ represents a random variable describing the level of wealth at the end of a time horizon, then the certainty equivalent $CE(\tilde{x})$ can be calculated from

(12) $u(CE(\tilde{x})) = u(\tilde{x})$.

Another value is the amount of money $RP(\tilde{x})$ an individual would give up to avoid the risk,

(13) $u(\tilde{x}) = u(E[\tilde{x}] - RP(\tilde{x}))$,

where $RP(\tilde{x})$ is the risk premium. The risk premium is the difference between the expected value of the gamble and the certainty equivalent,

(14) $RP(\tilde{x}) = E[\tilde{x}] - CE(\tilde{x})$.

The risk premium $RP(\tilde{x})$ is the risk aversion in the 'large'. Pratt shows that a decision-maker is more locally risk averse for any level of wealth *x* than another decision-maker if and only if his certainty equivalent $CE(\tilde{x})$ is smaller than the certainty equivalent for the other decision-maker. Another case occurs when the decision maker has a convex Bernoulli utility function, exhibiting risk-loving preferences. The certainty equivalent is then greater than the expected value of the gamble and a positive amount in payment is required to avoid the game.

3.2.4 Common utility functions and their properties

The type of risk preferences that individuals could exhibit by necessity depends upon which utility function the researcher 'assigns' to them. For instance, a claim that was

first put forward by Pratt (1964) and that has attracted many supporters since, is that individuals should become less risk-averse as their wealth increases (Eisenhauer and Ventura 2003; Ogaki and Zhang 2001; Saha, Shumway, and Talpaz 1994; Wik et al. 2004). That is, with increasing wealth and fixed income people should become more willing to participate in gambles for equal variability in wealth, so that their risk-tolerance increases. Table 3-2 presents five different utility functions in the linear risk tolerance class which have been frequently used in the literature.[5]

Table 3-2

Class of utility functions with linear risk tolerance

	$u(x)$	r_A	t_A	Risk preference	Type of r_A
Linear	$Ax+B$	0	∞	Risk-neutral	CARA
Exponential	$-e^{-rx}$	r	$1/r$	Risk-averse; Risk-loving	CARA
Logarithmic	$log(x+B)$	$1/(x+B)$	$x+B$	Risk-averse; Risk-loving	DARA
Power	$x^{(1-A)}/(1-A), A \neq 1$	A/x	x/A	Risk-averse; Risk-loving	DARA
Quadratic	$A+Bx-Cx^2$	$2C/(B-2Cx)$	$(B-2Cx)/2C$	Risk-averse; Risk-loving	IARA

The linear utility has the property of CARA; risk-aversion is unaffected by changes in wealth and the decision-maker maximizes expected utility so that he is risk-ignorant. Similarly to the linear utility function, the exponential utility function also exhibits

[5] This class of utility functions is sometimes called Hyperbolic Absolute Risk Aversion (HARA), implying that risk aversion is a hyperbolic function of wealth as risk-tolerance is the inverse of risk-aversion.

CARA. In this case, however, the utility function permits the full range of risk preferences. Of all utility functions presented in Table 3-2, this is also the only one that allows the aggregation of individuals' risk preferences to a representative agent. Through a Pareto-optimal sharing rule, Wilson (1968) has showed that a syndicate only has a group utility function when there is either an agreement among the syndicate members on the assessment of the probabilities or if they have identical cautiousness functions.[6] The exponential utility function has the property of CARA, which is equivalent to constant cautiousness. Hence, one of the two conditions is always met, and in the absence of agreement on the assessment of probabilities, the exponential utility function is the only one that allows the aggregation of individual utility functions to one representative group utility function.[7] Both the logarithmic and power utility has the property of DARA, whereas the quadratic utility function has the property of IARA.

Other more complex classes of utility functions also exist. Bell (1988) postulated that an individual under conditions of risk-aversion and/or decreasing absolute risk-aversion should never go back to a foregone alternative with increasing wealth. Hence, utility functions should satisfy a 'one-switch rule'. This implies that a particular prospect should either be globally preferred for all wealth levels, or preferred up to a certain wealth level and then never preferred again for greater wealth levels. For a risk-averse decision maker, the linear utility function is naturally found to be unsatisfactory as it expresses the preferences of an expected utility maximizer who is risk-ignorant. For this reason, the linear utility function does not admit the risk-averse decision maker to prefer

[6] The cautiousness function is the first-order derivative of the individual's risk tolerance function as in equation (11).

[7] See also Rubinstein (1974) and Amershi and Stoeckenius (1983) for a review.

a prospect with less uncertainty since it has the zero-switch property. The exponential utility function is found to be unsatisfactory for an individual under decreasing absolute risk aversion, since it also has the zero-switch property and the logarithmic utility function was shown to yield two preference reversals under increasing wealth for the same two prospects. The SUMEX utility function, which is constructed by adding two exponential utility functions where one of them has converged to a linear utility function, has not only the one-switch property but also (1) increases in wealth, (2) implies risk-aversion at all wealth levels, (3) suggest decreasing risk-aversion at all wealth levels, and (4) approaches risk-neutrality in the limit for small gambles. The concept of risk-consistency was also introduced, proposing that when a preference reversal occurs after an increase in wealth, this newly favoured alternative must have a greater expected value.

In a subsequent paper Bell (1995) ties measures of risk and return of an alternative to expected utility theory. By equating the expected utility of the final wealth with the risk-return function, he shows that the SUMEX utility function is increasing in wealth, concave, and exhibits decreasing risk-aversion. However, he also shows that alternatives can be compared by the risk-return function. Saha (1993) presents the expo-power utility which can accommodate both increasing and decreasing absolute and relative risk-aversion and it has subsequently been applied in Saha et al. (1994).

3.2.5 Private risk preferences

The typical approach to elicit individuals' risk preferences is to use experiments with real incentives, but hypothetical incentives and non-experimental approaches have been exploited as well. There have been some claims that the small monetary incentives provided in experiments are insufficient to elicit ‘true’ risk preferences. For this reason,

some researchers have undertaken experiments in developing countries where the monetary incentives sometimes constitute more than a month's income for the participants. Binswanger (1980) is an example of such a study. Risk preferences of farmers in rural India were investigated by using both real and hypothetical payoffs. The findings suggest that for smaller monetary incentives, people are close to risk-neutral. With increasing stakes, however, the average risk-aversion increases while the variance of risk-aversion decreases. Moreover, individuals that initially exhibit low risk-aversion demonstrate a faster change to more risk-averse preferences than individuals that originally display intermediate to moderate levels of risk-aversion. The results indicate that the relative risk-aversion exhibits an inverted u-shape over the range of payment levels, but decreasing absolute risk aversion. In a follow-up study Binswanger (1981) found that individuals were more likely to accept a small gamble at higher levels of wealth. On the other hand, the results support increasing partial risk-aversion, suggesting that with constant wealth, combined with increasing the scale of the prospect under consideration, the willingness to participate in a gamble decreases. Lastly, the findings indicate decreasing relative risk-aversion.

Another study with substantial monetary stakes is Kachelmeier and Shehata (1992). Using a two-stage approach, risk preferences of Chinese students were investigated by presenting them with a choice of either a lottery prospect or a certain fixed amount. Individuals were found to be risk-loving for small chances of winning. With increasing probability of winning, however, individuals became increasingly less risk-tolerant and at the limit approximately risk neutral or marginally risk-averse. This held for both low and high payment levels. The results tend in the direction of increasing relative risk-aversion. A recent example of a study with high stakes is Wik et al. (2004).

When examining households in southern Africa implementing both hypothetical and real stakes, they found evidence for DARA and increasing partial risk-aversion with respect to income. Moreover, no significant differences were found between prospects with hypothetical stakes and prospects with real stakes. Holt and Laury (2002) applied both real and hypothetical incentives for a wide range of payoffs, from a couple of dollars to several hundred dollars. They found that individuals were risk-averse even for small stakes, and interestingly there are no significant differences in elicited risk-preferences for small real payoffs and high hypothetical payoffs. However, when comparing large real and hypothetical payoffs, subjects are much more risk-averse for the former. All in all, the results suggest that subjects are insensitive to increases in hypothetical payoffs, but with real payoffs they become substantially more risk-averse as payoffs increase. Thus, these findings support increasing relative risk-aversion but decreasing absolute risk-aversion. Finally, the study strongly advocates the use of real payoffs for high-incentive conditions.

3.2.6 Private versus social risk preferences

Private risk preferences under incentive compatible conditions have been investigated in numerous articles, but the corresponding literature on when and how risk preferences in a social context differ from private risk preferences is meagre and the results inconclusive. A noteworthy characteristic of this literature is that no attempts have been made to develop a formal structural model on the link between private and social risk preferences. A structural model can probably at most be regarded as a candidate positive theory which portrays the actions of an ideal decision maker under some stylized circumstances. Even so, it enables one to conceptualize the relationship between private and social risk

preferences and provides a benchmark from which behavioural deviations and anomalies can be measured and understood.

Studying the aforementioned risk preferences brings on extra worries for the researcher as the additional complexity introduces new sources of variability. Firstly, there are several accounts of participants being sensitive to the risk elicitation instruments used (Berg, Dickhaut, and McCabe 2005; Dave et al. 2008; Isaac and James 2000). Likewise, it has been shown that even subtle experimental manipulations, such as the wording of the instructions, can have far-reaching effects on behaviour. Also, a particular concern when investigating other-regarding preferences are that the scrutiny exhibited in experiments may yield pro-social behaviour that has little to do with concern for the well-being of others, but rather concerns self-presentation (Levitt and List 2007a; Levitt and List 2007b). This fact makes it an elusive task to compare and extract any general findings and successful replications are often lacking.[8] As an illustration, Kerr, MacCoun, and Kramer (1996) reviewed the related literature on when and why groups are more biased in judgments than individuals, using three of the four judgmental bias types established by Hastie and Rasinski (1988).[9] The survey is limited to the nearly 30 pre-1996 studies implementing discussions in face-to-face meetings, with no clear pattern

[8] See Armstrong (2003), Hubbard and Armstrong (1994), and Leone and Schultz (1980) for a discussion on the value of replications and replications with extensions, but the tendency in marketing and the social sciences in general to discount this value.

[9] Hastie and Rasinski (1988) labelled them: 'direct assessment of criterion-judgment relationship', 'use a bad cue', and 'miss a good cue'. Kerr, MacCoun, and Kramer (1996) referred to them as: sins of imprecision, commission, and omission. The first type subsumes the conjunction fallacy; (Tversky and Kahneman 1983). The second type encompasses the fundamental attribution error (Jones and Harris 1967). An example of the last type is the base rate fallacy (Bar-Hillel 1980; Kahneman and Tversky 1973). As a note, it appears as if this schemata is neither intersubjectively unambiguous nor mutually exclusive (Hunt 2002). Consider preference reversals due to framing. One could calculate the theoretically correct way to make the decision through expected utilities and the bias is then a 'sin of imprecision'. At the same time, it could be classified as a 'sin of commission'; using information that is proscribed.

found. [10] For all three judgmental bias types, the results either suggest attenuation or amplification of bias for groups, and within studies there are several examples of inconclusive results.

Whether or not risk preferences change in a group setting was early on the agenda in Social Psychology and Marketing, but the approach chosen in these articles lends itself to criticism. Firstly, the choice dilemmas are not incentive compatible, so the conclusions are derived from responses to hypothetical scenarios – often referred to as a choice dilemma questionnaire (CDQ). Secondly, scenarios span over a wide variety of domains such as health risk, product performance risk, money risk, and social risk – here interpreted as the variance of an embarrassment or peer disapproval variable. A standard result from prospect theory is that individuals treat risky outcomes within a domain differently depending on whether framed as gains or losses (Ariely, Huber, and Wertenbroch 2005; Kahneman 1992; Kahneman and Tversky 1984; Kahneman and Tversky 1979). Hence, it does not seem unlikely that individuals then could hold domain-specific attitudes toward risk. Instead, participants' risk preferences are typically assumed to be consistent across domains and are consequently measured as the average cross-domain response.[11] Thirdly, for studies examining shifts from individual to unanimous group decisions, the sample size at the group level of analysis is only $(1/N)$

[10] See also Kerr, Niedermeier, and Kaplan (1999) for a review on bias in jurors versus juries, and Jones and Roelofsma (2000) for a review on the potential for biases in team decision-making.

[11] Recent findings suggest: (1) concave preferences for time loss but convex for money loss (Leclerc, Schmitt, and Dubé 1995); (2) no sunk cost effect for time (Soman 2001); (3) with increasing variance people become more risk averse for money but less risk averse for time (Okada and Hoch 2004); (4) a salient interdependent self leads to increased money risk-taking; but less social risk-taking (Mandel 2003); (5) specific preferences for work, money, health, recreational, ethical, and social risks (Soane and Chmiel 2005; Weber, Blais, and Betz 2002); (6) children hold specific risk preferences for physical and gambling risks (Morrongiello, Lasenby-Lessard, and Corbett 2009); and (7) the choice dilemma questionnaire score is not factorially pure (Kamalanabhan, Sunder, and Vasanthi 2000).

of the individual-level sample size, where *N* represents the group size. Fourthly, the studies do not typically deal with potential order effects by randomizing the order of individual versus group tasks or running parallel sessions and controlling for the order. Lastly, for studies requiring unanimous decisions, the results emerge from: (1) averaging among groups and (2) averaging within groups. Hence, the results could easily arise as an artefact of averaging some individual tendencies to take greater risk, some individual tendencies to take less risk, and some individuals in fact being invariant.

The term 'risky shift' is likely due to Stoner (1961), who set out to test whether groups would be more cautious, but instead found that unanimous group decisions reached after face-to-face discussions were significantly more risky than the average of the individual group members' prior decisions. Subsequent studies have in many cases supported the existence of risky shifts, and which has likewise been observed for non-unanimous decisions, but where participants first discuss the choice dilemmas: discussion-without-consensus condition or listening to other groups discussing the matter before stating their individual choices. Hence, these early studies lend some support to risky shifts being invariant to requirements for unanimous decisions, but group discussions seem to be a critical element. Notable examples of early studies finding risky shifts are Wallach, Kogan, and Bem (1962), Wallach and Kogan (1965), Bateson (1966), Kogan and Wallach (1967), Johnson and Andrews (1971), Woodside (1972), and Bennett, Lindskold, and Bennett (1973).

Other studies have in lieu of this found evidence for a 'cautious shift'. Rabow et al. (1966) and Chandler and Rabow (1969) applied a discussion-with-consensus condition and found that items previously generating risky shifts, did not differ at all when the central person in the choice dilemma was changed from an impersonal one to a

familial relation. What is more, for choice scenarios involving norm conflict, groups were more cautious. Stoner (1968) used a discussion-with-consensus treatment and found that the majority of items generated risky shifts, while two created conservative shifts and three no significant shifts. Fraser, Gouge, and Billig (1971) employed a discussion-without consensus condition and of the eight items, three resulted in a risky shift, three produced a cautious shift and two were unchanged. In addition, this study provides evidence of items initially regarded as 'risky', as in participants requiring low odds of success, becoming more risky after group discussion. Analogously, cautious items became even more cautious after the group discussion. Moreover, under a discussion-with-consensus condition, it was found that group members' initial risk attitudes were amplified after the discussion. Stern and Gazda (1975) presented students with an industrial buying scenario with competing suppliers; the discussion-without-consensus led subjects to choose less risky suppliers, but the discussion-with-consensus resulted in choosing more risky suppliers in the final decision. Instancing the many intricate methodological issues and pitfalls in investigating risky and cautious shifts, Woodside (1974), in a reply to Reingen (1974), reanalyzed the data he first presented in Woodside (1972). When looking at the eight items separately, only two risky shifts occurred between prediscussion and consensual product decisions, but four risky shifts occurred between prediscussion and individual postdiscussion decisions. Moreover, the risky shift reported in Woodside (1972) could have been obtained through only one statistically significant shift.

As indicated, group interaction can induce either risky or cautious shifts, but in some cases shifts are absent. However, shifts in other preferences and attitudes have also been observed. A generalization of preference and attitude shifts is known as

'polarization' or 'choice shift'; the average of the group members' individual views are amplified after some form of group interaction (Bishop, Finch, and Formby 1990; Bordley 1983; Eliaz, Ray, and Razin 2006; Fraser, Gouge, and Billig 1971; Isenberg 1986; Moscovici and Zavalloni 1969; Myers and Lamm 1976; Pruitt 1971a; Pruitt 1971b).[12] Examples of polarization, some of which take place in simulated environments, are found in attitudes toward racial issues (Myers and Bishop 1970), jury decisions (Bray and Noble 1978; Myers and Kaplan 1976), managerial decision making (El-Shinnawy and Vinze 1998; Whitney and Smith 1983), faculty candidate and restaurant selection (Rao and Steckel 1991), and altruism (Luhan, Kocher, and Sutter 2009). A recent marketing example is the escalation of organizational buying dyads' satisfaction judgments following interaction (Bohlmann et al. 2006).

Traditionally, the risky shift has been explained by a 'diffusion of responsibility'; knowing that the decision is shared with a group of people, the burden of risk taking and the comprehended pain of failure feel less intimidating (Cline and Cline 1980; Ruchala, Hill, and Dalton 1996; Wallach, Kogan, and Bem 1964; Wallach, Kogan, and Bem 1962; Wiesenthal, Austrom, and Silverman 1983). However, it has been criticized for being one-sided; allegedly, it cannot explain the concurrent existence of risky and cautious shifts (Pruitt 1971a; Pruitt 1971b). On the other hand, the diffusion of responsibility has successfully explained the 'bystander effect'; a reduced dispositions to take action, such as helping under emergency or violence, when others are present (Ahmed 1979; Darley

[12] The terms risky and cautious shift, polarization and choice shift are not always used coherently. The first two refer to change in preferences for risk-taking, whereas polarization refers to group-induced shifts in general attitudes and preferences. However, polarization also requires amplification of already held preferences. Hence, moving to extremities, while disregarding the reference point, is not polarization per se. Choice shifts are sometimes used as an equivalent term to polarization, but sometimes as representing any group-induced change in preferences, no matter the reference point. See Fraser, Gouge, and Billig (1971) for a discussion.

and Latané 1968; Jones and Foshay 1984). Interfering in a violent situation constitutes a potential risk for the intervener, so not helping could be interpreted as a cautious shift. The diffusion of responsibility has recently been revisited by Eliaz, Ray, and Razin (2006), who view choice shifts as a reflection of individuals disposition toward Allais paradox preferences. It is shown that this violation of expected utility sometimes causes cautious shifts and sometimes risky shifts. Consequently, individuals' attitude toward risk is assumed to be immaterial to choice shifts. In short, individuals are assumed to be perfectly egoistical.

The common view today is that group polarization is due to either of or both 'social comparison' and 'persuasive argumentation' (Burnstein and Vinokur 1977; Isenberg 1986; Sanders and Baron 1977). The former refers to a wish of individuals to perceive and present themselves in a socially desirable light. More specific explanations such as 'risk-as-value' (Brown 1965; Siegrist, Cvetkovich, and Gutscher 2002), 'leadership theory' (Marquis 1962), 'risk-as-feelings' (Hsee and Weber 1997; Loewenstein et al. 2001), 'the stereotype hypothesis' (Daruvala 2007; Eckel and Grossman 2002; Hsee and Weber 1999; Hsee and Weber 1997), and even the aforementioned 'diffusion-of-responsibility' could all potentially be subsumed in this category. Persuasive argumentation instead puts the focus on the number and strength of pro and con arguments a person recalls when taking a position. An example is 'the new-information theory' (Myers and Lamm 1976) whereby individuals bring new information to the table, thereby acting as qua influencers on others. The mentioned choice shift explanations all involve some form of psychological process, but an alternative approach is simply to measure individual preferences and evaluate how different aggregation rules, or 'social decision schemes' (SDS) affect the group decision outcome (Davis 1976; Davis

1973; Davis et al. 1974; Kerr, MacCoun, and Kramer 1996). This approach, however, does not distinguish between private risk attitudes and individual preferences over social risk. Consequently, in light of the evidence presented herein, it is perhaps less useful as a descriptive theory, but nevertheless serves as a baseline.[13]

There are relatively few studies investigating risk differentials under incentive-compatible conditions. The available studies span from advisory scenarios, where participants make choices over others' money without risk to themselves (Chakravarty et al. 2005; Daruvala 2007; Stone, Yates, and Caruthers 2002), to group decision situations (Baker, Laury, and Williams 2008; Beck 1994; Harrison et al. 2005; Keller, Sarin, and Sounderpandian 2007; Masclet et al. 2009; Shupp and Williams 2008). In the second category, all reviewed studies except Beck (1994) held group size constant to either dyads (Bateman and Munro 2005; Keller, Sarin, and Sounderpandian 2007) or triplets (Baker, Laury, and Williams 2008; Harrison et al. 2005; Masclet et al. 2009; Shupp and Williams 2008) and all but one study (Harrison et al. 2005) required the participants to arrive upon a unanimous group decision. An attempt to classify these studies is presented in Table 3-3.[14]

In the reviewed material, the three studies investigating advisory scenarios form a special class. Chakravarty et al. (2005) did not find a statistically significant difference between own risk attitude and beliefs of others' risk attitudes. In contrast, Daruvala

[13] The 'simple majority' states that the group decides on the alternative favoured by a majority of group members. 'Proportionality', says that the probability of a view prevalent in the group equals the relative frequency of that view. This scheme covers the case when groups support the view of a randomly selected individual and could hence also be referred to as 'random dictatorial'. The proportionality/random dictatorial scheme is employed in random dictator games (Rutström and Williams 2000; Weibull 2004). Lastly, using the 'equiprobability' scheme, any alternative with at least one supporter is equally likely to be chosen.

[14] The classification variables are divided into environmental and institutional, and thus follows the definition of microeconomic systems developed by Smith (1982).

(2007) reported that risk averse individuals anticipated others to be less risk averse and vice versa for risk loving individuals. Both studies, however, suggest that individuals own attitude and advice are different; Chakravarty et al. (2005) found that individuals took more risks with other people's money, whereas Daruvala (2007) discovered that advice is a mixture of advisors' own attitudes and predictions of others' attitudes. On the other hand, Stone, Yates, and Caruthers (2002) did not detect any differences between self and advisory decision making. A second class is made up of studies with non-anonymous participants making unanimous decisions (Baker, Laury, and Williams 2008; Bateman and Munro 2005; Keller, Sarin, and Sounderpandian 2007; Shupp and Williams 2008). In this class, group members participated in discussions prior to making the decision. Results from all four studies suggest that groups in general would elicit less risk taking tendencies than the average of its members' private attitudes. In the category 'unanimous group decision', only one study kept group members anonymous (Masclet et al. 2009). This setup prevents group discussion, but groups still made more cautious choices than the average of its members.

Finally, a separate class are studies investigating change between private risk preferences and individual preferences over social risk, such as Harrison et al. (2005) and Beck (1994). In Harrison et al. (2005) participants first ran a dictator game (Andreoni and Miller 2002; Eckel and Grossman 1996; Kahneman, Knetsch, and Thaler 1986) to elicit altruistic preferences. Anonymous groups with three individuals were formed and group members voted individually on the group's risk attitude.[15] Roughly four fifths of

[15] In a simple majority voting situation, the median voter's preference will in some circumstances decide the outcome and comprise a Condorcet winner (Black 1948; Congleton 2003; Deacon and Shapiro 1975). However, a caveat when inferring about individuals' preferences as elicited in simple majority situations is that they might represent strategic voting preferences (Eckel and Holt 1989; Harrison and McDaniel 2008; Holt and Anderson 1999).

the participants exhibited some degree of altruism in the dictator game. However, no significant difference between preferences over private risk and individual preferences over social risk was found. Beck (1994) compared private risk preferences with both individual preferences and unanimous group preferences over social risk, but in the context of income redistribution. Hence, if individuals have limited knowledge about future income and societal position, in its extreme form often referred to as being behind 'a veil of ignorance', what distributional rule would they prefer? Three conjectures were investigated. The 'insurance motive' suggests that individuals will favour a reduction in inequality, but only as an insurance against uncertainty. On the other hand, a 'sympathetic observer', who is equally sympathetic toward all, but also concerned with aggregate utility would choose a more equal distribution (Alexander 1974). Finally, Rawls (1971) describes individuals as having no probabilistic knowledge regarding the future. This ignorance is hypothesized to make them impartial, so that they adopt a maximin rule, where transfers to those worst off are at a maximum. To investigate these conjectures the participants chose from a list of several income distributions ranging from highly risky ones to perfectly deterministic and egalitarian outcomes, including the maximin solution. In general, participants exhibited private risk aversion, but no significant difference between the two social decision tasks was found and group size had no impact on the decisions.[16]

[16] From a hobby-philosopher's point of view, it seems as if 'egalitarian' need not necessarily have to mean 'risk averse' and vice versa. A first exploratory attempt to investigate this is undertaken in Kroll and Davidovitz (2003). Also, the three conjectures imply different choice circumstances, yet they are all investigated in the choice-under-risk framework. For instance, the 'sympathetic observer' conjecture suggests that the agent decides without private stake. On the other hand the 'Rawlsian' conjecture is a choice under ignorance but with private stake. The latter case is an artificial situation as it assumes that people cannot even estimate subjective probabilities. This means that the concepts of risk and uncertainty have no bearing.

Table 3-3

Classification of studies examining private-social risk differentials

	Environment			Institution				
	N	ANON	PRES	BLFS	ADVR	SDS	ORDR	ELIN
Chakravarty et al. (2005)	1	Y	-	Y	Y	DI	RND,	HL
Daruvala (2007)	10	-	Y	Y	Y	PR	P, B, S	BDM
Stone et al. (2002)	1	-	Y	-	Y	DI	P, S	MPL
Baker et al. (2008)	3	-	Y	-	-	UN_{DIS}	P, S, P	HL
Shupp & Williams (2008)	3	-	Y	-	-	UN_{DIS}	P, S	MPL
Keller et al. (2007)	2	-	Y	-	-	UN_{DIS}	P, S	MPL
Bateman & Munro (2005)	2	-	Y	Y	-	UN_{DIS}	P, B, S	MPL
Masclet et al. (2009)	3	Y	Y	-	-	UN_{IV}	RND	HL
Beck (1994)	{8,...,28}	-	Y	-	-	PR, UN_{DIS}	P, S	MPL
Harrison et al. (2005)	3	Y	Y	-	-	SM	RND	HL
Enström (2009)	**{3,6}**	**Y**	**Y**	**Y**	-	**PR**	**RND**	**HL**

N	Number of people affected by the decision maker; for Beck (1994) the group sizes were {8,9,15,17,18,28}
ANON	Group members were anonymous
PRES	Other group members were present
BLFS	Participants indicated beliefs on others' risk preferences
ADVR	The decision maker was an advisor and did not face any personal risk
SDS	Social Decision Schema; unanimous with discussion (UN_{DIS}) vs. iterative voting (UN_{IV}), dictatorial (DI), proportionality (PR), simple majority (SM)
ORDR	Order of private (P), social (S) & belief (B) tasks; attempts to account for order effects is labelled RND
ELIN	Elicitation Instrument; Holt-Laury (HL), Becker-DeGroot-Marschak (BDM), Multiple Price List (MPL)

3.2.7 Altruism

A generic definition of altruism often found in dictionaries and encyclopaedias is 'the unselfish concern for others' which is often considered to be antonymous with 'egoism'. Thomas Nagel defines altruism as, 'merely a willingness to act in the consideration of the interests of other persons, without the need of ulterior motives' (1979). Some of the

ulterior motives that have been mentioned in connection with seemingly benevolent actions are prestige, status, avoiding despite of others, reputation building, avoiding seeming greedy, maintaining a positive identity, social pressure, guilt, and even sympathy (Andreoni 1990; Becker 1974; Levitt and List 2007a; Levitt and List 2007b).

An ulterior motive conjectured in giving is the 'warm glow' (Andreoni 1989; Andreoni 1990). This entity is somewhat vaguely described as a stimulating feeling individuals could experience when giving something voluntarily, and the warm glow could potentially be felt regardless of whether the receiver finds the gift useful. However, if the giver is ignorant toward the usefulness of the gift, then this action does not satisfy the criteria on acting in the consideration of the interests of others and thereby is not altruism. On the other hand, altruistic acts motivated by the warm glow, at least to some extent, are labelled 'impure altruism'. Consequently, altruism without warm glow is called 'pure altruism'. A second layer of definitions are paternalistic versus non-paternalistic altruism (Hori 2009; Pollak 1988). The root of paternalistic altruism is that the benefactor feels that the beneficiary is incapable of making the right decision. A typical example is when parents wish their children to adopt a certain consumption pattern as part of the consumer socialization (John 1999). A third ramification is that individuals would need not be perfectly informed on others' preferences, or even have the ability to identify others' preferences. Hence, one might think of acts intended to be in the consideration of others' interest to be 'off base'.[17]

The reconciliation of pure and impure altruism is unresolved and 'knotty'. Even so, it is possible to make some speculation by looking at results obtained through

[17] A suggestion is to refer to these situations as individuals exhibiting idiosyncratic and situational levels of 'altruistic accuracy'.

functional magnetic resonance imaging (fMRI) of the brain. First of all, there is accumulated evidence that the brain areas active when people experience emotions are also active when observing others struck by the same emotions (Decety and Jackson 2004; Gallese 2001; Lamm, Batson, and Decety 2007; Preston and de Waal 2002). This fact could explain feelings of empathy. Secondly, Harbaugh, Mayr, and Burghart (2007) scanned brain activity while individuals played a dictator game. Participants made decisions whether or not to give money to the food bank while also exposed to mandatory deductions of their endowment to the food bank. Interestingly, all three situations; payoff to oneself and mandatory versus voluntary donations to the food bank resulted in neural activity in the striatum and the insula. These brain regions are also active when music, sex, food, and drugs are experienced. Also, participants that had greater activation for his or her own payoff in the brain were less likely to contribute to the food bank and the neural activity was typically larger in the voluntary than in the mandatory situations. This differential is explained as stemming from the ability to make the choice under the voluntary condition, as opposed to the mandatory condition.

Moll et al. (2006) investigated brain activity when participants chose to donate or not to real charitable organizations. Monetary rewards, as well as donations to the charitable organizations, triggered activity in the striatum and the midbrain ventral tegmental area (VTA); both parts of the mesolimbic pathway. However, the striatum was more active for donations than monetary rewards. Donations also resulted in specific activity in the subgenual area which is also active when humans look at their partners and babies.

All in all, the results suggest that some reward processing, and consequently 'warm glow', is naturally occurring across situations, and is not specific to giving. In

fact, it almost seems like a fallacy to think that human beings could be involved in altruistic acts, or any acts for that matter, without feeling anything. Therefore, a cautious supposition is that neural reward processing and hence warm glow is necessary but not sufficient for altruistic acts to happen. Whether the positive feelings associated with the reward processing would qualify as an ulterior motive is a separate question. It could be argued, however, that more calculative and cognitive motives, such as expecting a favour in return, would constitute more 'severe' selfish reasons than the affective ones. Another issue is to what extent individuals are consciously aware of the positive feelings associated with the warm glow and whether they are actively (and consciously) seeking and counting on receiving the stimulating reward.

3.3 Experimental design

3.3.1 The elicitation procedure for risk preferences

Risk preference differentials were investigated using the ten paired lottery-choice decision format originally developed by Holt and Laury **(**2002**)**. Table 3-4 presents the basic payoff matrix for the ten decisions and these payoffs are 3 times the baseline used in Holt and Laury (2002).

Table 3-4

The ten paired lottery choice decisions

Decision	Option A	Option B	$EP_A - EP_B$
1	10% of \$6.00, 90% of \$4.80	10% of \$11.55, 90% of \$0.30	\$3.50
2	20% of \$6.00, 80% of \$4.80	20% of \$11.55, 80% of \$0.30	\$2.49
3	30% of \$6.00, 70% of \$4.80	30% of \$11.55, 70% of \$0.30	\$1.49
4	40% of \$6.00, 60% of \$4.80	40% of \$11.55, 60% of \$0.30	\$0.48
5	50% of \$6.00, 50% of \$4.80	50% of \$11.55, 50% of \$0.30	– \$0.53
6	60% of \$6.00, 40% of \$4.80	60% of \$11.55, 40% of \$0.30	– \$1.53
7	70% of \$6.00, 30% of \$4.80	70% of \$11.55, 30% of \$0.30	– \$2.54
8	80% of \$6.00, 20% of \$4.80	80% of \$11.55, 20% of \$0.30	– \$3.54
9	90% of \$6.00, 10% of \$4.80	90% of \$11.55, 10% of \$0.30	– \$4.55
10	100% of \$6.00, 0% of \$4.80	100% of \$11.55, 0% of \$0.30	– \$5.55

The variability of the payoffs of \$6.00 and \$4.80 for Option A is less than the payoff of \$11.55 and \$0.30 for Option B. Hence, Option A constitutes the 'safe' choice and Option B the 'risky' choice. Looking at the first decision, the probability of the high payoff for both options is only 10% and only an individual with extreme risk seeking attitudes would choose Option B. Notice also that incentive to choose Option A, in terms of the expected payoff, is \$3.50.[18] When moving down the table, the probability of the high payoff outcomes increases for both options. For the first four decisions, the expected value from Option A is greater than that of B. A risk-ignorant person would therefore prefer Option A for the first four decisions, and thereafter B. On the other hand, Option A is safer than B for all ten decisions, as the variance of the payoff is substantially lower. A risk-averse person would therefore switch to Option B sometime after the fifth

[18] In the experiment the expected payoffs were not provided in the instructions to the participants. The full experimental script is provided in Appendix A.

decision, whereas a risk-loving individual would switch to B sometime before the fifth decision. As one proceeds down the matrix, the expected value of both lotteries increases, but the expected value of lottery B becomes greater than the expected value of lottery A from the fifth decision and onward. Finally, in the tenth decision the participants chose between deterministic outcomes of $6.00 and $11.55, and this decision serves as a control that the participants understand the choice task.

From the observed switch point, one can calculate the Arrow-Pratt coefficient of relative risk-aversion. Assuming a constant relative risk-aversion for the decision-maker, the utility for money is

$$U(x) = \frac{x^{(1-R_R)}}{1-R_R}, \tag{15}$$

where R_R is the coefficient of relative risk-aversion. Using the payoffs in Table 3-4, it follows that the individual determines the preferred switch point t^* from

$$t^*(R_R) = \frac{4.80^{(1-R_R)} - 0.30^{(1-R_R)}}{11.55^{(1-R_R)} - 0.30^{(1-R_R)} + 4.80^{(1-R_R)} - 6.00^{(1-R_R)}} \tag{16}$$

The observed switch points should be understood as discrete observations from an underlying continuum of possible switch points. A conservative claim is to say that the

switch point is forward-censored; an observation of $t^*(R_R)$ has a true switch point in the interval of $[t^*(R_R),\ t^*(R_R)+1]$.[19]

The study ran as a computer mediated experiment with all sessions conducted at the University of Alberta and participants recruited from the University of Alberta volunteer pool. All participants came to one room initially where they were seated in separate booths facing a computer screen, with faces away from each other. After a general oral instruction by the experimenter all participants began the study at the same time. All substantive task instructions were provided on the computer screens and when performing the first task, subjects had no information regarding the nature of the subsequent tasks. In each session all respondents participated in a private risk attitude task, a task pertaining to individual risk attitudes toward social risk, and a task were they indicated their beliefs on others' choices. Both the 'private' and 'social task' were incentive compatible, but not the 'beliefs' task. The participant chose A or B in each row, and after the participants finished, a random number generator drew a number between 1 and 100 to select the decision for payout for that participant. If the number was 10 or lower, decision 1 was played out and if between 11 and 20, decision 2 was played out and so on. Once the decision row was determined, the random number generator decided on the higher or the lower amount. For all three tasks, the same payoff matrix was used. The experimental session started with some instructions pertaining to how participants' payments would be calculated and also showing the payoff matrix in Table 3-4. On the next computer screen, participants first undertook a practice round

[19] One could also say that $t^*(R_R)$ comes from the interval $[t^*(R_R)-0.5,\ t^*(R_R)+0.5]$. It implies, however, that individuals having a 'true' switch point of say 2.4 would choose 2, thereby exhibiting significantly greater risk-loving attitudes.

where the payments were given as 'XYZ' before the study commenced. The order in which participants carried out the 'private', 'social', and 'beliefs' tasks was randomized.

For the 'social' task, participants were randomly allocated to groups of three or six. The instructions for this task let participants know that following completion of the task, one group member's preferences would be randomly chosen and binding for the group. As the group size was either $N = 3$ or $N = 6$, the chance that one individual's preferences would be binding was 1/3 and 1/6, respectively. Each group member then received the same resulting payment at the end of the study. For the 'private' task, the resulting payment was determined immediately following the completion and was presented on the computer screen. However, as the order of the 'private', 'social', and 'beliefs' task was randomized and responses from all group members were necessary to determine the group payment outcome, the payment for the 'social' task was determined at the end of the study. Before completing a survey and an elicitation procedure for altruistic preferences, participants had the chance of commenting on the study in an open-ended question. When participants finished the study, the final screen gave the total payment for the 'private' and 'social' tasks and each participant was then paid in cash. In addition to earnings in the 'private' and 'social' tasks, each participant received $10 for showing up as agreed.

3.3.2 The elicitation procedure for altruistic preferences

A crucial issue is how to measure individuals' level of altruism and a common approach in experimental economics is to let participants play a dictator game, such as in Forsythe et al. (1994), Eckel and Grossman (1996), Andreoni and Miller (2002), Harrison (2005). Following this approach, it is assumed that the magnitude of allocations from the

proposer to the responder is correlated with levels of altruism. The typical finding across studies is that roughly 60% of participants contribute at least some money to the respondents, with an average of roughly 20% of the total fund (Levitt and List 2007b). However, the norms of society speak clearly on what the 'right thing' to do is in these circumstances. Hence, donations in dictator games do not necessarily mean that individuals hold altruistic preferences, but could depend upon several of the factors identified by Levitt and List (2007a; 2007b). In particular, Hoffman et al. (1994) found that when the experimenter could infer individual participants' choices, roughly three times as many participants donated money in comparison to the experimenter-participant anonymity condition. In a follow-up study, Hoffman, McCabe, and Smith (1996) determined that donations decreased with social distance in the dictator—participant relationship. In a similar vein of thought, Haley and Fessler (2005) manipulated visual cues of others by showing eyespots on the computer screen and ascertained that the proportion of non-zero donators increased significantly.

Recently both Bardsley (2008) and Dana, Weber, and Kuang (2007) cast doubt on the interpretation of outcomes in dictator games. Bardsley (2008) included an option of taking money from the responder. The results suggest that individuals that give in dictator games would also take when presented with taking options and two explanations of this phenomenon were provided. [20] Firstly, when an additional option is added to the choice menu, participants could be affected by a 'range' effect, so that the likelihood of an option to be chosen is affected by its location in the choice set (Parducci and Wedell 1986). Hence, according to this explanation, the perception of a 'kind' action depends on

[20] In replication study List (2007) found qualitatively similar results.

where in the range of available options the alternative is located. Secondly, giving may stem from 'demand characteristics' where the apparent 'unselfishness' is an artefact of the experimental context. Thus, participants know the dictator game is about 'giving' and thus try to do their best to be 'good' participants. Dana, Weber, and Kuang (2007) tested whether individuals are compelled to give due to situational factors in dictator games. The degree of transparency were manipulated in three ways by (1) providing dictators with the option of being ignorant regarding the precise consequences to the recipient, (2) having several dictators, and (3) allowing outcomes to result from other causes than the dictator's actions. In comparison with the baseline dictator game, only half of the participants chose the fair option, suggesting that individuals will try to exploit various situational justifications for behaving selfishly while maintaining positive identification with the self (Akerlof and Kranton 2000; Bénabou and Tirole 2006; Murnighan, Oesch, and Pillutla 2001).

For the reasons given above, the approach chosen here is to elicit individuals' altruistic preferences through a psychometric scale, by invoking the 'empathy-altruism hypothesis', developed primarily by Daniel Batson (Batson and Ahmad 2001; Batson et al. 1989; Batson et al. 1988; Batson et al. 1995; Batson and Moran 1999; Batson et al. 1983; Batson and Shaw 1991; Batson and Weeks 1996). According to this hypothesis, feelings of empathy for the well-being of others yield an altruistic motive to act pro-socially. Idiosyncratic levels of dispositional empathy are elicited through the Interpersonal Reactivity Index (IRI) developed by Mark Davis (Davis 1983; Davis 1980). In this index, dispositional empathy is understood as consisting of both cognitive and affective components. Specifically, the IRI consists of 28 questions divided equally among four distinguishable subscales each measuring one aspect of 'empathy'. The first

one measures 'perspective taking' (PT), or the ability to adopt or understand others' point of view. In the second sub-scale, the focus is 'empathetic concern' (EC), or the disposition to feel sympathy and pity for misfortunate others. The personal distress subscale (PD) deals with the propensity to experience feelings of distress and discomfort when others are in situations of extreme distress. Lastly, the fantasy subscale (FS) emphasizes individuals' inclination toward fantasizing and portraying themselves being in a fictional story.

Recently, the neurosciences have started to investigate the correlation of various psychometric scales and brain activity through functional magnetic resonance imaging (fMRI). Particularly, in a recent study a significant correlation was found between the PT subscale of the IRI and brain activity in the mirror neuron system (Gazzola, Aziz-Zadeh, and Keysers 2006). The mirror neuron system is active when an individual performs some action but also when an individual observes another person performing an action (Etzel, Gazzola, and Keysers 2008; Gazzola and Keysers 2009; Iacoboni et al. 1999). Also, there is now accumulated evidence that the brain areas active when a person experiences emotions are also active when other persons are struck by emotions (Decety and Jackson 2004; Gallese 2001; Preston and de Waal 2002). Jabbi, Swart, and Keysers (2007) tested whether the anterior insula and adjacent frontal operculum brain areas (IFO) were active when individuals observe others' gustatory emotions after tasting the content of a cup. The IFO is thought to be an essential part of the mirror neuron system and is normally active during exposure to tastants and odorants. Measures of empathy from the IRI were correlated with the brain activity while observing pleased, neutral, and disgusted facial expressions. For the PD and FS subscales a significant correlation was obtained when watching pleased and disgusted facial expression. That only the PD and

FS subscales showed significant was explained by that the IFO is mainly involved in the involuntary reverberating and sensing of similar states in the observer, often referred to as emotional contagion. The cognitive aspect of people's voluntary efforts, such as understanding goals and motivations of others is instead captured by the PT subscale. The EC subscale goes beyond the mere simulational aspects of another person's state by measuring to what extent the induced state could result in feelings of sympathy.

3.4 Experimental results

3.4.1 Results from a pilot study

This section reports the result from a pilot study undertaken with undergraduate students at the University of Alberta. Participants were randomly assigned to two groups in two separate classrooms. In both groups, the participants were asked to make ten choices between two lotteries, according to the Holt-Laury format (Holt and Laury 2002). In treatment group one—T1—their choices only affected their own payoff. In treatment group two—T2—the proportionality decision scheme was used so that there was *1/N* probability that each individual's payoff decision sheet was randomly drawn and binding for the whole group of students. Table 3-5 presents the ten choices between the paired lotteries as well as the differences in expected payoff.

Table 3-5

The ten paired lottery choice decisions in the pilot study

Decision	Option A	Option B	$EP_A - EP_B$
1	10% of \$1.50, 90% of \$1.25	10% of \$3.00, 90% of \$0.25	\$.75
2	20% of \$1.50, 80% of \$1.25	20% of \$3.00, 80% of \$0.25	\$.50
3	30% of \$1.50, 70% of \$1.25	30% of \$3.00, 70% of \$0.25	\$.25
4	40% of \$1.50, 60% of \$1.25	40% of \$3.00, 60% of \$0.25	\$0
5	50% of \$1.50, 50% of \$1.25	50% of \$3.00, 50% of \$0.25	– \$.25
6	60% of \$1.50, 40% of \$1.25	60% of \$3.00, 40% of \$0.25	– \$.50
7	70% of \$1.50, 30% of \$1.25	70% of \$3.00, 30% of \$0.25	– \$.75
8	80% of \$1.50, 20% of \$1.25	80% of \$3.00, 20% of \$0.25	– \$1.00
9	90% of \$1.50, 10% of \$1.25	90% of \$3.00, 10% of \$0.25	– \$1.25
10	100% of \$1.50, 0% of \$1.25	100% of \$3.00, 0% of \$0.25	– \$1.50

In this study three measures of risk-preferences were used. Lusk and Coble (2004) and Holt and Laury (2002) both suggested to report the sum of the number of safe choices an individual makes. In addition, Lusk and Coble (2004) also reported when an individual first switched from A to B. Finally, an analysis of individuals' coefficient of relative risk-aversion is provided.

Figure 3-1 presents the proportion of safe choices in each of the ten decisions as well as the risk-neutral predictions. Note that for the fourth outcome the expected value from the A option equals that of the B option. Therefore, a risk-neutral individual has a choice between two paths which is reflected in the two parallel dashed lines. The line with triangles depicts the proportion of safe choices for treatment group T1 and the line with squares portrays the same measure for treatment group T2. From Figure 3-1 one can learn that both treatment groups have risk preferences lying to the right of the risk-neutral predictions. Hence, subjects in both treatment groups have a tendency towards risk-

averse behaviour. Comparing the two treatment groups, it is evident that the T1 treatment results in a more rapid decay of the probability of choosing the safe option than for T2. For instance, at the fifth and the sixth decision nodes, subjects in the first treatment are more than three times more likely to choose the risky option than for subjects in the second treatment.

Figure 3-1

Proportion of safe choices and the risk-neutral predictions

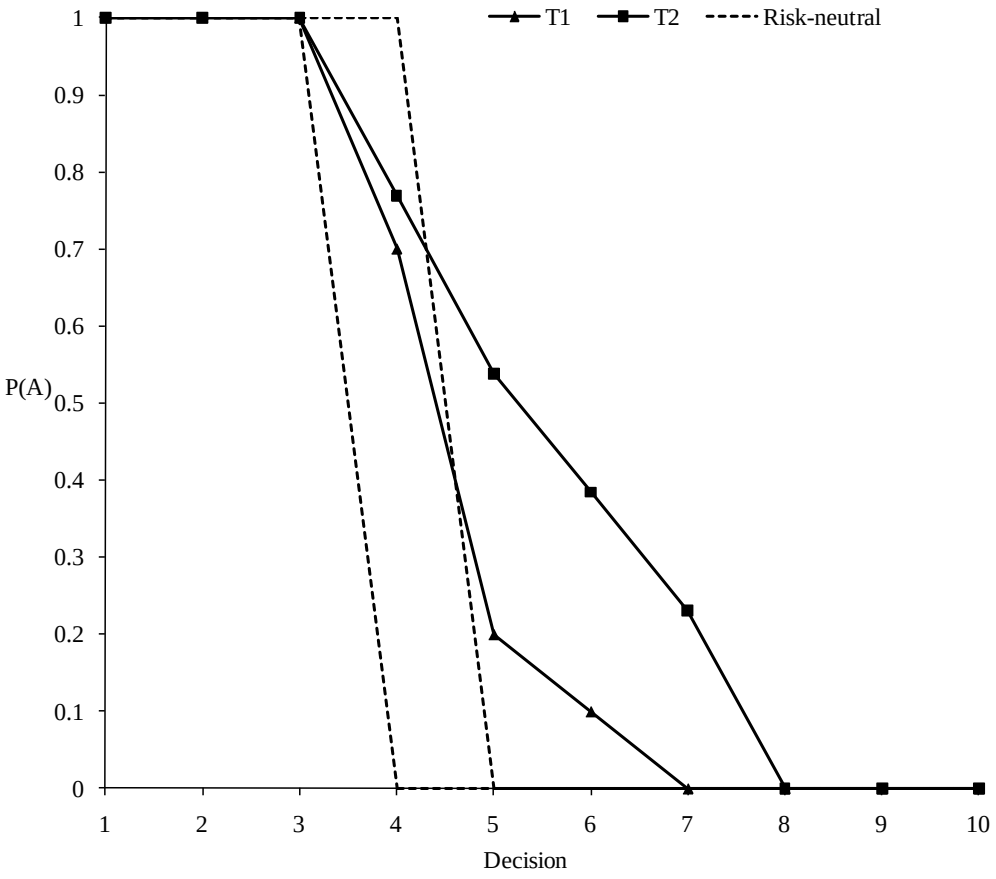


Table 3-6 presents descriptive statistics on the number of safe choices and the first instance of the risky option. The average and the median number of safe choices across subjects in the T2 treatment exceed those of the T1 treatment, although the variance is considerable higher for the former treatment group. An examination of the first risky choice reveals the same pattern; the T2 treatment results in subjects being more cautious. On average, the first risky choice occur almost one decision node later for the social treatment group but the variance among subjects is four times greater.

Table 3-6

The number of safe choices and first risky choice across treatments

		Treatment	
		T1	T2
Number of safe choices	Mean	4.00	4.92
	Median	4.00	5.00
	SD	0.82	1.44
First risky choice	Mean	4.90	5.77
	Median	5.00	6.00
	SD	0.72	1.42
N		10	13

An analysis of the duration times until an individual switches from the safe option to the risky option has been undertaken. A commonly used distribution function for duration analyses is the Weibull. The Weibull distribution is either concave or convex and when the shape parameter attains the value of one, it collapses to a simple exponential

distribution. Let t_i represent the time elapsed before the i^{th} individual first switches from the safe option to the risky option. The survival time is assigned a Weibull distribution,

(17) $$t_i \sim Weibull(r, \mu_i),$$

where r represents the shape parameter of the survival function and μ_i is the characteristic life parameter of the i^{th} individual. The characteristic life parameter is parameterized as

(18) $$\log \mu_i = \alpha + \beta_{ex} Ex_i + \sum_{k=2}^{3} \beta_{em,k} Em_{i,k} + \sum_{k=2}^{3} \beta_{gr,k} Gr_{i,k} + \beta_{pt} Pt_i + \beta_{fe} Fe_i + \beta_{t1} T1_i,$$

where Ex_i is a five-level covariate representing the individual's monthly expenses, $Em_{i,k}$ are dummy variables representing the three-level factor for empathy, $Gr_{i,k}$ are dummy variables corresponding to preferences on working individually or in a group, Pt_i is a dummy variable indicating if the subject have a part-time job, Fe_i is a dummy variable indicating a female subject, and $T1_i$ constitutes a dummy variable for the T1 treatment. In the estimation it is recognized that the survival times are interval censored so that an observed switch point t_i is taken as an observation from the continuous underlying scale in the interval $t_i + 1$.

Table 3-7 presents the estimation result. All regression coefficients were assigned a non-informative prior normal distribution with a mean of zero (0). The shape parameter of the Weibull survival distribution was given a non-informative Gamma prior,

$r \sim Gamma(1.0,0.0001)$, which is slowly decreasing on the positive real line. Two chains were run and the trace plots of the updates suggested convergence.

In general, a positive sign of the parameter estimates indicate a negative impact on the survival time and thus a negative sign implies a longer survival time. Therefore, any variable with a positive parameter estimate suggests a more risk tended individual and vice versa. Firstly, the result clearly suggests that the participants in the T1 treatment are less risk averse than participants in the T2 treatment. Holding all other variables constant, this implies that individuals are less willing to take risks when they know there is a non-zero probability that their choice will affect others. Moreover, the results lend some support to the view that female subjects are more risk-averse, although the base case, male, is contained in the credibility interval.

Individuals with higher monthly expenditures are less risk-averse in general. Possible explanations are that this variable serves as a proxy for wealth, in which case the person can afford to make risky choices, or that these persons have a more carefree relationship with money. Respondents indicating that they are less empathetic than their peers seem to be more risk-averse. Last, participants that preferred to work individually tended to switch to the risky option earlier than people preferring to work in a group. As for the other dummy variable sets, there is some overlapping in the credibility intervals. The magnitude of the shape parameter suggests a convex life distribution.

Table 3-7

Weibull regression on duration until switching to risky option

Variable	Posterior mean	Credible interval 2.5%, Median, 97.5%
Intercept	-14.96	-20.93, -14.83, -9.72
Expenditure	0.18	-.22, .18, .59
More empathetic	1.79	-.013, 1.81, 3.50
As empathetic as my peers	0	
Less empathetic	-1.25	-3.02, -1.24, .45
Prefer to work individually	2.00	.17, 1.97, 3.98
Do not care	0	
Prefer to work in a group	-0.72	-2.21, -.70, .65
Employment	-1.90	-3.89, -1.88, -.085
Gender	-0.69	-1.80, -.69, .42
T1	2.21	.79, 2.18, 3.73
T2	0	
r	7.76	5.38, 7.69, 10.56
Deviance information criterion (DIC)	98.68	

A duration analysis is a natural starting point in the study of any process involving a change in state and time elapsed before a change of state occurs. Unfortunately, the duration analysis on switch points does not provide a universal measure of risk-aversion. Therefore, an analysis of individuals' coefficient of relative risk-aversion has been carried out. Table 3-8 reports the number of safe choices and the range of the corresponding relative risk aversion for both treatment groups. The figures indicate that most subjects are risk-neutral to risk-averse. Comparing the two treatments, there is a clear indication that the coefficients of relative risk-aversion are higher for subjects in the T2 treatment.

Table 3-8

Number of safe choices and coefficient of relative risk-aversion

Number of safe choices before switching to risky option	Relative risk-aversion	Treatment	
		T1	T2
0-1	$r_R < -.89$	0%	0%
2	$-.89 < r_R < -.39$	0%	0%
3	$-.39 < r_R < .00$	30%	0%
4	$.00 < r_R < .34$	50%	30%
5	$.34 < r_R < .66$	20%	30%
6	$.66 < r_R < 1.00$	0%	20%
7	$1.00 < r_R < 1.40$	0%	20%
8	$1.40 < r_R < 1.96$	0%	0%
9-10	$1.96 < r_R$	0%	0%
N		10	13

An interval censored regression has been estimated where the dependent variable is the range of relative risk-aversion coefficients. The regression model is

$$(19) \qquad r_{Ri} = \alpha + \beta_{ex} Ex_i + \sum_{k=2}^{3} \beta_{em,k} Em_{i,k} + \sum_{k=2}^{3} \beta_{gr,k} Gr_{i,k} + \beta_{pt} Pt_i + \beta_{fe} Fe_i + \beta_{t1} T1_i ,$$

using the same set of covariates as for the duration model. The parameter estimates are presented in Table 3-9. As for the duration model, participants in the T1 treatment exhibited more risk-loving preferences than subjects in the T2 treatment. Looking at the participants' self-assessment of empathy, this had an insignificant impact on risk preferences. Moreover, the gender of the participant, whether he or she was employed, and monthly expenditures did not matter with regards to risk preferences. The same holds for preferences to work in a group or not. The treatment variable together with the

prefer-to-work-individually variable demonstrates the greatest impact in magnitude on the risk-aversion coefficient.

Table 3-9

Interval-censored regression of relative risk-aversion coefficients

Variable	Posterior mean	Credible interval 2.5%, Median, 97.5%
Intercept	0.51	-.36, .51, 1.39
Expenditure	-.095	-.26, -.095, .072
More empathetic	-.26	-.80, -.26, .28
As empathetic as my peers	0	
Less empathetic	.21	-.33, .21, .74
Prefer to work individually	-.39	-.81, -.39, .033
Do not care	0	
Prefer to work in a group	.29	-.22, .29, .81
Employment	.30	-.15, .30, .74
Gender	.23	-.17, .23, .63
T1	-.38	-.74, -.38, -.022
T2	0	
Deviance information criterion (DIC)	54.60	

3.4.2 Results from the within-subjects study of risk preferences

In total 51 individuals participated in this study, with about half of the participants making a choice for a group of 3 and the other half making a choice on behalf of six people. Apart from the $10 show up payment that all participants received, the total minimum and maximum earnings for the two incentive compatible tasks were $0.60 and $23.10, respectively, with a median earning of $16.35.

Looking at the raw data, Figure 3-2 presents the proportion of safe choices in the private decision task, social decision task with 3 group members (Social-3), social decision task with 6 group members (Social-6), and beliefs on others' preferences (Beliefs) as well as the risk-neutral path. Generally speaking, any trajectory of risk preferences located to the right of the risk-neutral path suggests a risk-averse individual, whereas if located to the left suggests a risk-loving individual. Hence, although some participants chose option B already in the first, second, and third decisions, all subsequent decision tasks are located to the right of the risk-neutral path, suggesting that the average participant hold risk-averse preferences. At the aggregate level there appear to be some evidence that those choices undertaken in the Social-6 task were more risk-averse than in the Social-3 task. A third finding is that decisions in the Social-3 task seem to match participants' beliefs on others' preferences and the private preferences are generally more risk-averse than for the former two tasks.

Note that there are some instances of preferring an option with a deterministic outcome with a lower payment than another deterministic outcome with a higher payment; that is, choosing option A with a certain outcome of $6.00 over option B with a certain outcome of $11.55 in the tenth and final decision. In total, five individuals in the private task misunderstood this task and were excluded from further analysis. There were also examples of individuals having multiple switch points; in other words, switching back and forth between the safe and the risky options. Some argue that the switching behaviour simply reflects individuals' indifference between the two options (Andersen et al. 2006; Harrison et al. 2005). Another possible interpretation is that the switching behaviour simply stems from lack of involvement or ignorance. In fact, the multiple

switching points are more common when making a decision on behalf of a group and providing beliefs on others' preferences.

Figure 3-2

Proportion of safe choices for the private, social, and beliefs tasks and the risk-neutral prediction

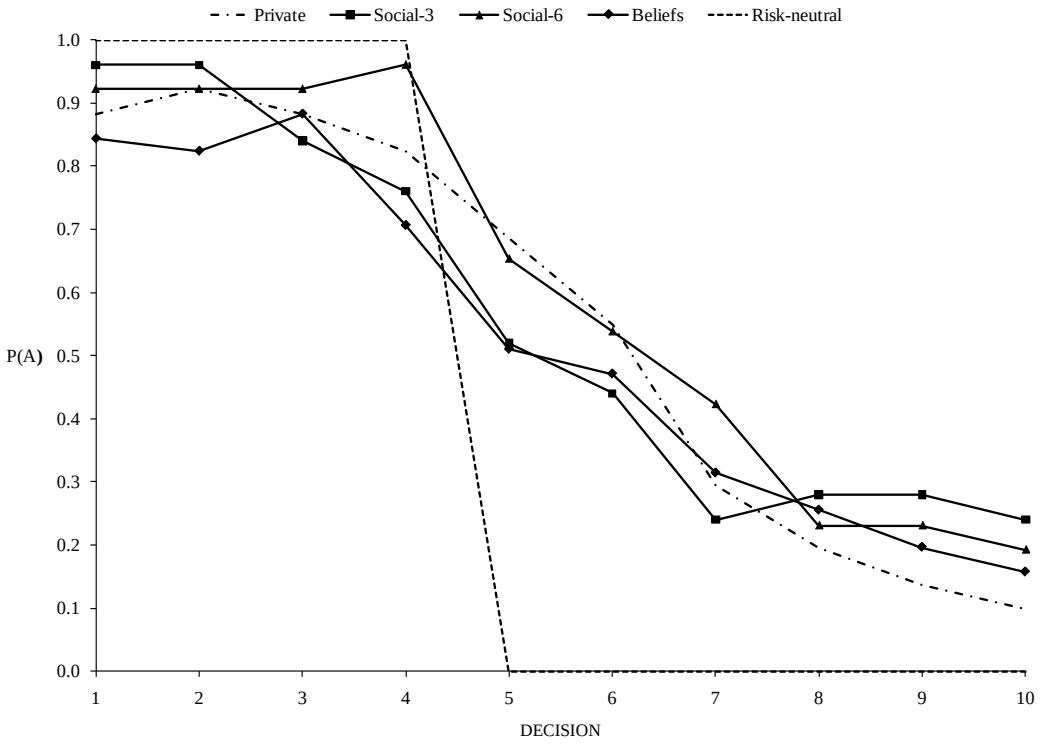


Table 3-10 presents descriptive statistics on when the first choice of the risky option B occurred as well as the number of safe choices across the ten decisions. Looking first at the number of safe choices, the private task exhibited the most consensuses among participants followed by the Social-3 and Social-6 tasks. The greatest dispersion on risk preferences were found in the Beliefs task. Broadly speaking, if using the number of safe

choices as an indicator of risk attitudes, the Beliefs task seemed to result in the least number of cautious choices, followed by the Private and Social -3 tasks. Individuals in the Social-6 task tended to be comparatively more risk averse with regards to the number of safe choices. On the other hand, the middle individual across the tasks had equal preferences in terms of the number of safe choices.

Individuals' first choice of the risky option B determines their risk aversion coefficients in an interval. The figures provided in Table 3-10 suggest that the average individual assess others as being more risk-loving. Then again, for this task the risk assessments exhibit the greatest spread. Looking at the middle individual, it appears as if the Private and Social-6 tasks had the most risk-averse preferences, followed by the Social-3 and Beliefs tasks.

Table 3-10

The number of safe choices and first risky choice for the four tasks

		Task			
		Private	Social-3	Social-6	Beliefs
Number of safe choices	Mean	5.11	5.09	5.71	4.76
	Median	5.00	5.00	5.00	5.00
	SD	1.64	1.85	1.76	2.13
First risky choice	Mean	5.54	5.05	6.04	4.80
	Median	6.00	5.00	6.00	5.00
	SD	2.30	2.06	2.49	2.64
N		46	22	24	46

Table 3-11 presents the number of safe choices and corresponding coefficient of relative risk-aversion across the four tasks. For all four tasks most participants exhibited risk-neutral to moderately risk-averse preferences. For the Private and Social-3 tasks, the bulk of the participants were slightly risk-averse, whereas for the Social-6 and Beliefs task most of them displayed risk-neutral behaviour. When comparing the Social-3 and Social-6 tasks, it appears as if the larger group yields more cautious decisions than the smaller group. Also, in particular for the Private and Beliefs tasks, the relative risk-aversion coefficients are more dispersed, but seem to be rather compressed in the Social-6 task.

Table 3-11

Number of safe choices and coefficient of relative risk-aversion

Number of safe choices before switching to risky option	Risk-aversion	Proportion of safe choices across tasks			
		Private	Social-3	Social-6	Beliefs
0-1	$r_R < -.95$	10.9%	9.1%	8.3%	19.6%
2	$-.95 < r_R < -.49$	4.3%	9.1%	0	2.2%
3	$-.45 < r_R < -.15$	6.5%	18.1%	0	13.0%
4	$-.15 < r_R < .15$	19.6%	22.7%	37.5%	23.9%
5	$.15 < r_R < .41$	21.7%	22.7%	16.7%	17.4%
6	$.41 < r_R < .68$	19.6%	4.6%	4.2%	10.9%
7	$.68 < r_R < .97$	13.0%	9.1%	20.8%	6.5%
8	$.97 < r_R < 1.37$	2.2%	4.6%	4.2%	4.3%
9-10	$1.37 < r_R$	2.2%	0%	8.3%	2.2%
N		46	22	24	46

All participants completed the 28-item IRI scale to measure their dispositional empathy. Table 3-12 presents descriptive statistics on the four 7-item subscales of the IRI; Perspective taking (PT), Empathetic concern (EC), Fantasy (FS), and personal distress (PD). Participants responded to each item on a 5-point scale from 0 (does not describe me well) to 4 (describes me well); hence, the minimum score for each subscale is 0 and the maximum possible score for each subscale is 28. Some of the items in each subscale are reversely coded. As seen there is a fair bit of variation among the participants on the four subscales; this holds in particular for the FS and PT scales. These data therefore provide support for a rich distribution of dispositional empathy.[21] [22]

[21] A useful benchmark is the data provided in Davis (1980) on undergraduate students at the University of Texas; the average score on the FS subscale was 18.75 for females and 15.73 for males. The average scores on the other three subscales, for females and males, were: PT, 17.96 versus 16.78; EC, 21.67 versus 19.04, and PD, 12.28 versus 9.46.

[22] Note that taking the average of these four subscales or summing them is meaningless. The four subscales represent four distinct factors of 'empathy' and are not all positively correlated (Davis 1980).

Table 3-12

Descriptive statistics on the four subscales of the IRI

	PT	EC	FS	PD
Max	26	26	27	19
Min	9	12	2	3
Mean	17.78	18.85	16.04	13.57
Median	17.00	19.00	16.50	14.00
SD	3.97	3.08	4.90	3.42
$N = 46$				

PT = Perspective Taking

EC = Empathetic Concern

FS = Fantasy

PD = Personal Distress

Two interval-censored regressions have been estimated where the dependent variable is the range of relative risk-aversion coefficients.[23] The two regression models are

$$(20) \qquad r_{Ri} = \alpha + \beta_{Ag} Ag_i + \beta_{Fe} Fe + \sum_{k=2}^{3} \beta_{Ta,k} Ta_{i,k} + \beta_{Ex,k} Ex_i + \sum_{k=2}^{3} \beta_{Or,k} Or_{i,k} + \sum_{k=1}^{2} \beta_{Wo,k} Wo_{i.k}$$

and

$$(21) \qquad \begin{aligned} r_{Ri} &= \alpha + \beta_{Ag} Ag_i + \beta_{Fe} Fe_i + \sum_{k=2}^{3} \beta_{Ta,k} Ta_{i,k} + \beta_{Ex,k} Ex_i + \sum_{k=2}^{3} \beta_{Or,k} Or_{i,k} + \sum_{k=1}^{2} \beta_{Wo,k} Wo_{i.k} \\ &+ \beta_{Ec} Ec_i + \beta_{Fs} Fs_i + \beta_{Pd} Pd_i + \beta_{Pt} Pt_i + \sum_{k=1,k\neq 2}^{3} \beta_{We,k} We_{i,k} \end{aligned}$$

[23] The models were estimated using WinBUGS 1.4.3: http://www.mrc-bsu.cam.ac.uk/bugs/.

In both model (20) and (21), Ag_i corresponds to the participant's age, Fe_i indicates a female participant, $Ta_{i,k}$ represents the task (i.e. Private, Social-3, Social-6, Beliefs) Ex_i is a five-level covariate representing the individual's monthly expenses, $Or_{i,k}$ is a dummy variable constituting the participant's own risk-assessment, $Wo_{i,k}$ is a dummy variable mapping preferences to work individually or in a group. In model (21), the four subscales of the IRI have been added as well as a dummy variable comprising participants' self-assessment of wealth. For all dummy variables, the options having the greatest number of observations were always chosen as the base case.

The estimation results of the two models are presented in Table 3-13. Comparing the two models it is apparent that Model (21) is the less suitable model as the Deviance Information Criterion (DIC) is substantially greater; hence, while accounting for the additional number of parameters estimated in Model (21), Model (20) would generally speaking predict a duplicate dataset best.[24] [25]

Across all four tasks, while controlling for other idiosyncratic differences, females are substantially more risk-averse. In fact, the magnitude of this difference is so large that it equals a switch-point located over two decisions later than for males; for

[24] Generally speaking, all models in this section were estimated using two chains and 200,000 updates with a burn-in period of 20,000. In order to examine whether the simulations were converging the two chains were given differing initial values; observation of the dynamic trace plots clearly suggested that convergence had occurred. All regression coefficients were assigned non-informative prior normal distributions with zero mean.

[25] Note that the Frequentist's dichotomous testing of a null hypothesis has limited correspondence with the doings of the Bayesian. The output of a Bayesian analysis is a probability distribution representing the investigator's most current, but hopefully not final, state of knowledge regarding the range of a parameter's value. As such, it can be used to evaluate the probability that a given parameter falls between an upper and lower bound or is greater or less than a certain threshold. Put differently, this approach offers less 'crudeness' as to the merit of a specific explanatory variable.

instance, this corresponds to a difference between being risk-loving and risk-averse, or risk-neutral and very risk-averse. This finding goes well in hand with the results obtained by Powell and Ansic (1997) and others (Eckel and Grossman 2008; Shellman 2005; Weber, Blais, and Betz 2002).[26] Looking at the task-specific risk attitudes, participants exhibited most risk-loving preferences in the Beliefs task. Hence, on average participants typically believed that others held more risk-loving attitudes. The credible intervals for the two social decision tasks—Social-3 and Social-6—are essentially insignificant as the credible intervals enclose zero.

Participants' self-assessment of their risk-attitudes was accurate to some extent; individuals who classified themselves as being more risk-loving than their peers exhibited more risk-loving attitudes across the four tasks than the people in the reference group. A complication is that individuals who classified themselves as being about as risk-loving as their peers exhibited even more risk-loving tendencies than the former group.[27] Hence, participants in this group somewhat underestimated their own risk-loving tendencies. This finding could be interpreted as a false consensus effect; put differently, a misidentified opinion that others hold the same views and preferences (Bauman and Geher 2002; Gershoff, Mukherjee, and Mukhopadhyay 2008; Ross, Greene, and House 1977).

[26] However, note that Schubert et al. (1999) found gender differences in risk preferences for non-contextual gambling situations, but not in contextual situations.

[27] Note that one can also infer and classify participants' risk-preferences in relation to beliefs of others' through the observed difference between the beliefs and private tasks. For instance, if a participant chose six safe options in the private task but four in the beliefs task, then that would correspond to 'More risk-loving than my peers', and so forth. However, the correspondence between this approach and participants' literal self-assessment was modest with only half of the individuals qualifying for the same classification in the two approaches.

Participants' age had essentially zero impact on risk-attitudes; on the other hand, the data set did not offer much variation among the participants in terms of age. In the more parsimonious model, the largest impact on risk-attitudes was found for the dummy variable representing female participants together with the dummy variable representing to a preference to work in a group. Comparing the two models, the parameter estimates for the common variables suggest the same order among categories and the signs are unchanged. Of the four subscales of the IRI, three had marginal impact. The PD scale, however, have a clear impact in the direction of more risk-loving tendencies.

Table 3-13

Two interval-censored regressions of relative risk-aversion coefficients

Variable	Model (36)		Model (37)	
	Posterior mean	Credible interval 2.5%, Median, 97.5%	Posterior mean	Credible interval 2.5%, Median, 97.5%
Intercept	-0.80	-2.08, -0.80, 0.47	-0.0085	-2.49, -0.0087, 2.46
Age	0.0035	-0.035, 0.0035, 0.042	0.023	-0.018, 0.023, 0.063
Female	0.66	0.025, 0.66, 1.30	0.24	-0.52, 0.24, 1.01
Private	0		0	
Social-3	0.026	-0.83, 0.025, 0.88	0.049	-0.77, 0.048, 0.87
Social-6	0.15	-0.68, 0.15, 0.97	0.13	-0.67, 0.12, 0.92
Beliefs	-0.52	-1.20, -0.52, 0.17	-0.52	-1.17, -0.52, 0.14
Expenses	0.19	-0.14, 0.19, 0.52	0.17	-0.15, 0.17, 0.50
EC			0.048	-0.082, 0.048, 0.18
FS			-0.0049	-0.074, -0.0049, 0.064
PD			-0.14	-0.24, -0.14, -0.044
PT			0.029	-0.048, 0.029, 0.10
Own risk preferences in comparison to peers:				
More risk-loving	-0.53	-1.28, -0.53, 0.23	-0.76	-1.51, -0.76, -0.0019
About as risk-loving	-1.43	-2.13, -1.43, -0.74	-1.37	-2.10, -1.37, -0.64
Less risk-loving	0		0	
Prefer to work:				
Individually	0		0	
In group	-0.66	-1.45, -0.66, 0.13	-0.41	-1.20, -0.41, 0.37
Indifferent	0.49	-0.15, 0.49, 1.13	0.81	0.14, 0.81, 1.49
Own wealth in comparison to peers:				
Wealthier			-0.49	-1.29, -0.49, 0.31
As wealthy			0	
Less Wealthy			-1.19	-2.01, -1.19, -0.38
DIC	576.16		582.53	

The categorization of risk-aversion coefficients is interesting as an indicator of aggregate preferences under different choice conditions in a population. However, it does not reveal much with regards to the core issue of if and how individuals change their risk preferences from a private to a social situation and also if this change has anything to do with beliefs on others' preferences and possibly individuals' levels of empathy. Looking first at if individuals become more risk-loving or less risk-loving when making decisions on behalf of others, Table 3-14 presents a cross tabulation representing this change. Participants are divided into categories according to whether their private preferences were risk-loving ($r_R < -0.15$), risk-averse ($0.15 < r_R$), or risk-neutral ($-0.15 < r_R < 0.15$) and whether their social choices exhibited more risk-averse tendencies, less risk-averse tendencies, or invariant risk preferences.[28] For the present purpose, the Social-3 and Social-6 categories have been collocated into the category Social.

Looking at Table 3-14 it is evident that essentially 60 percent of all participants had risk-averse private preferences, with the remainder of the participants about equally divided between risk-loving and risk-neutral preferences. Interestingly, the majority of participants changed their risk preferences in the social decision task and this segment could hence be called 'risk-switchers'; almost 60 percent belonged to this group. Of these, roughly one and a half times as many became less risk-averse than became more risk-averse. Examining specifically participants with private risk-neutral attitudes, most maintained their preferences in the social choice and in fact, across the three private preference categories, the invariant group was most evident among risk-neutral

[28] Hence, the change in risk preferences is calculated as the difference in the number of safe choices (before choosing the risky option) between the social task and the private task. Note that according to this definition individuals classified as 'risk-loving' in their social choice could still belong to the group 'more risk-averse' if their relative risk aversion coefficient increased from say $-.95 < r_R < -.49$ to $-.49 < r_R < -.15$. Moreover, within the groups of 'More risk-averse' and 'Less risk-averse', there is substantial variation in the magnitude of the change.

participants. Furthermore, in the risk-neutral group individuals were three times more likely to become less risk-averse than becoming more risk-averse.

An interesting comparison is the likelihood that risk-loving individuals became more risk-averse and risk-averse individuals became less risk-averse. In other words, how comparatively likely these two groups were to move away from any of the two extremes in the direction of risk-neutrality. Interestingly, the risk-loving individuals were almost two times more likely to move toward risk-neutrality. Both the risk-loving and risk-averse folks having these social choice preferences could therefore be subsumed in the segment 'risk-reverters' and this description fitted close to 40 percent of the sample. Altogether, these findings could indicate at least some support for the risk-as-feelings hypothesis, as suggested by Hsee and Weber (1997) and Loewenstein et al. (2001); hence, decisions under personal risk can often be described as 'hot' decision-making meaning that emotions and feelings constitute the foundation rather than cognitive processes. Even so, when they predict others' preferences they fail to recognize that other people have equally strong feelings regarding risk and the prediction therefore revert toward risk-neutrality.

Comparing how likely risk-averse versus risk-loving individuals were to exhibit social risk attitudes that were even more extreme reveals that members of the latter group were about two times more likely than members of the former group to exhibit this type of differential. These individuals could therefore be labelled 'risk-polarisers' and they comprised fully one tenth of the sample. Finally, of the nine possible combinations of private risk-preferences and change in the social choice, the cell with the greatest share of participants was risk-averse individuals with invariant social choice risk preferences. Almost one third of all participants belonged to this group.

Table 3-14

Cross tabulation of private risk preferences against the social-private differential

		Social		
Private	Total	More risk-averse	Invariant	Less risk-averse
Total	46	11	19	16
	100%	100%	100%	100%
	100%	23.9%	41.3%	34.8%
	100%	23.9%	41.3%	34.8%
Risk-loving	10	7	1	2
	21.7%	63.6%	5.3%	12.5%
	100%	70.0%	10.0%	20.0%%
	21.7%	15.2%	2.2%	4.3%
Risk-neutral	9	1	5	3
	19.6%	9.1%	26.3%	18.7%
	100%	11.1%	55.6%	33.3%
	19.6%	2.2%	10.9%	6.5%
Risk-averse	27	3	13	11
	58.7%	27.3%	68.4%	68.8%
	100%	11.1%	48.1%	40.8%
	58.7%	6.5%	28.3%	23.9%

The listed cell percentages are column, row, and total percentages.

Table 3-15 presents the corresponding cross tabulation of private risk preferences against the belief-private differential. As seen, the pattern of risk attitude changes is roughly on par with that of Table 3-14. However, in some cases there are substantial differences in the share percentages. For instance, within the group of risk-neutral individuals there is a comparatively larger share of people maintaining their private preferences in their prediction of others' risk attitudes. Overall, the share of risk-polarisers equals that for the

social task, whereas the segments of risk-switchers and risk-reverters are somewhat smaller.

Table 3-15

Cross tabulation of private risk preferences against the belief-private differential

		Belief		
Private	Total	More risk-averse	Invariant	Less risk-averse
Total	46	11	14	21
	100%	100%	100%	100%
	100%	23.9%	41.3%	34.8%
	100%	23.9%	41.3%	34.8%
Risk-loving	10	6	2	2
	21.7%	54.5%	14.3%	9.5%
	100%	60.0%	20.0%	20.0%
	21.7%	13.0%	4.3%	4.3%
Risk-neutral	9	2	3	4
	19.6%	18.2%	21.4%	19.0%
	100%	22.2%	33.3%	44.5%
	19.6%	4.3%	6.5%	8.7%
Risk-averse	27	3	9	15
	58.7%	27.3%	64.3%	71.5%
	100%	11.1%	33.3%	55.6%
	58.7%	6.5%	19.6%	32.6%

The listed cell percentages are column, row, and total percentages.

An important behavioural divider is whether or not individuals' social risk preferences were different than their private risk preferences. A related issue is to what extent this

change can be traced to individuals' beliefs on others' risk preferences. Equation (11) in Chapter 2 suggests that under uniform altruism the private-social risk differential is $\Delta r_i = R_A^i - r_A^i = \psi(\overline{r}_A^{\sim i} - r_A^i)$. Hence, individuals' social risk preferences can be written as

$$(22) \qquad R_A^i = \psi(\overline{r}_A^{\sim i} - r_A^i) + r_A^i,$$

where the parameter for the belief-private differential should be $0 \le \psi < 1$. Hence, the corresponding interval-censored regression to examine is

$$(23) \qquad R_{Ri} = \alpha + \beta_{diff}(\overline{r}_{Ri}^{\sim i} - r_{Ri}) + \beta_{pri} r_{Ri} + \beta_{Ec} Ec_i + \beta_{Fs} Fs_i + \beta_{Pd} Pd_i + \beta_{Pt} Pt_i .$$

The estimation results are presented in Table 3-16.[29] As shown, participants' private risk preferences clearly diffused into their social risk preferences; the lower limit of the corresponding credible interval is well above zero. Moreover, the difference between participants' private risk preferences and their beliefs on others preferences has the right sign and magnitude; the lower limit of the credible interval for the belief-private differential is just slightly below zero. There are several implications of these findings. Firstly, participants' social preferences were typically different than their private risk preferences. Secondly, their social preferences could be characterized as being a mixture of their private preferences and the belief-private differential. In other words, participants clearly acted upon their beliefs and in the right direction. However, on

[29] A separate regression was also estimated of the untransformed version of equation (11) in Chapter 2. The results from this regression clearly indicated a positive impact of the belief-private differential with the lower limit of the credible interval being greater than zero.

average the full belief-private differential did not translate into individuals' social risk preferences.[30] Hence, an individual with a negative belief-private differential would exhibit more risk-loving social preferences, whereas an individual with a positive belief-private differential would instead exhibit more risk-averse social preferences. It follows that in situations where the differential was zero, individuals' social risk preferences would equal their private preferences.

All four subscales of the IRI have credible intervals enclosing zero, suggesting that they are about as likely to have a marginal positive or negative impact on the social risk preferences. As is known from equation (11) in Chapter 2, however, the parameter for the belief-private differential is increasing in altruism which suggests an interaction between empathy and belief-private differential. Interestingly, a separate regression of the social-private differential against the interaction between the EC of the IRI and the belief-private differential resulted in a positive parameter estimate.

[30] In addition, an interval-censored regression was estimated where dummy variables representing participants' private risk preferences (i.e., risk-loving, risk-neutral, or risk-averse) were added. However, the credible intervals for these parameters were perfectly balanced around zero, indicating that the impact was equally likely to be negative as positive. Also, the DIC was substantially higher for this model.

Table 3-16

Interval-censored regression of social risk preferences against the belief-private differential and private risk preferences

Variable	Posterior mean	Credible interval 2.5%, Median, 97.5%
Intercept	1.58	-1.26, 1.58, 4.41
Beliefs-Private	0.18	-0.026, 0.18, 0.39
Private	0.65	0.40, 0.65, 0.89
EC	0.033	-0.12, 0.033, 0.19
FS	-0.068	-0.15, -0.069, 0.017
PD	-0.010	-0.14, -0.010, 0.12
PT	-0.052	-0.15, -0.052, 0.047
DIC	156.68	

3.5 Summary and discussion

In this chapter individuals' behaviour under risk has been investigated for two situations; private incentive-compatible decisions and incentive-compatible decisions on behalf of a group in which the decision-maker is a member. These situations are prevalent in multi-person households, but can also be encountered in partnerships and family-owned enterprises. The issue on hand was the reconciliation of others' preferences with those of the self.

All participants were asked to provide three responses; prediction of others' risk preferences and private and social risk attitudes. In addition, as an indicator of altruistic motives, four aspects of individuals' dispositional empathy were measured through the interpersonal reactivity index. The elicitation of individuals' dispositional empathy

revealed a fairly dispersed distribution of empathy levels for the four subscales across individuals, with mean levels comparable to those found in earlier studies.

Findings from the raw data suggest that the majority of participants had risk-averse private preferences and about as many were risk-loving as risk-neutral. The three risk elicitation tasks revealed that the majority of participants were risk-switchers and hence exhibited different risk preferences in the social decision task than in the private task. Within the segment of risk-switchers, most participants became more risk-loving than became more risk-averse. Moreover, people that had risk-loving private preferences were about two times more likely to move toward risk-neutrality or become more risk-loving than people that were risk-averse. Of the three private risk preference segments, participants with risk-neutral private preferences were most likely to maintain their private preferences in the social task.

An interval-censored regression of the structural model prescribing the link between individuals' private and social risk preferences clearly revealed that social risk preferences were different than their private preferences. In fact, the social preferences could be described as a mixture of private preferences and the belief-private differential. Hence, individuals acted on their beliefs, no matter if these beliefs corresponded to others' true preferences, so that the sign and magnitude of the parameter for the belief-private differential corresponded to the one predicted by the structural model.

Apart from the clear downward impact of the personal distress subscale on the risk coefficients in the pooled interval-censored model, the four subscales of the IRI had limited impact on the dependent variable. Even though the mean of the posterior distribution for the empathy subscales indicated an impact, the credible intervals were in most cases essentially balanced around the median zero, suggesting that they were

equally likely to have a small negative or a small positive impact. Note however that the derived structural model suggests an interaction effect between empathy and the belief-private differential. An interval-censored regression of this interaction along with the main effects resulted in unstable parameter estimates, however.

An interesting extension would be to undertake a similar experiment, but in the loss domain. When decision-makers conduct could cause losses for others it is likely that empathetic concerns would play a more salient role and hence some, if not all, of the four IRI subscales would be more likely to yield a measurable impact. Also, with a much larger data set it could be fruitful to run separate regression for people scoring high versus low on the empathetic concern subscale; the theoretical model predicts that the parameter for the belief-private differential should be higher for the first group. In addition, an interesting question to investigate is to what extent paternalism and empathetic preferences are correlated.

3.6 References

Aaker, David A. (1991), Managing Brand Equity: Capitalizing on the Value of a Brand Name: Free Press.

Ahmed, S. M. S. (1979), "Helping behavior as predicted by diffusion of responsibility, exchange theory, and traditional sex norm," Journal of Social Psychology, 109 (1), 153-54.

Akerlof, George A. and Rachel E. Kranton (2000), "Economics and identity," Quarterly Journal of Economics, 115 (3), 715-53.

Alexander, Sidney S. (1974), "Social evaluation through notional choice," Quarterly Journal of Economics, 88 (4), 597-624.

Allais, Maurice (1953), "Le Comportement de l'Homme Rationnel devant le Risque: Critique des Postulats et Axiomes de l'Ecole Americaine," Econometrica, 21 (4), 503-46.

Amershi, Amin H. and Jan H. W. Stoeckenius (1983), "The theory of syndicates and linear sharing rules," Econometrica, 51 (5), 1407-16.

Andersen, Steffen, Glenn W. Harrison, Morten Igel Lau, and E. Elisabet Rutström (2006), "Elicitation using multiple price list formats," Experimental Economics, 9 (4), 383-405.

Andreoni, James (1989), "Giving with impure altruism: Applications to charity and Ricardian equivalence," Journal of Political Economy, 97 (6), 1447-58.

---- (1990), "Impure altruism and donations to public goods: A theory of warm-glow giving," Economic Journal, 100 (401), 464-77.

Andreoni, James and John Miller (2002), "Giving according to GARP: An experimental test of the consistency of preferences for altruism," Econometrica, 70 (2), 737-53.

Ariely, Dan, Joel Huber, and Klaus Wertenbroch (2005), "When do losses loom larger than gains?," Journal of Marketing Research, 42 (2), 134-38.

Armstrong, J. Scott (2003), "Discovery and communication of important marketing findings: Evidence and proposals," Journal of Business Research, 56 (1), 69-84.

Arrow, Kenneth J. (1965), Aspects of the Theory of Risk-Bearing. Helsinki: Yrjö Jahnsson Foundation.

Baker, Ronald J., II, Susan K. Laury, and Arlington W. Williams (2008), "Comparing small-group and individual behavior in lottery-choice experiments," Southern Economic Journal, 75 (2), 367-82.

Bar-Hillel, Maya (1980), "The base-rate fallacy in probability judgments," Acta Psychologica, 44 (3), 211-33.

Bardsley, Nicholas (2008), "Dictator game giving: Altruism or artefact?," Experimental Economics, 11 (2), 122-33.

Bateman, Ian and Alistair Munro (2005), "An experiment on risky choice amongst households," Economic Journal, 115 (502), 176-89.

Bateson, Nicholas (1966), "Familiarization, group discussion, and risk taking," Journal of Experimental Social Psychology, 2 (2), 119-29.

Batson, C. Daniel and Nadia Ahmad (2001), "Empathy-induced altruism in a prisoner's dilemma II: What if the target of empathy has defected?," European Journal of Social Psychology, 31 (1), 25-36.

Batson, C. Daniel, Judy G. Batson, Cari A. Griffitt, Sergio Barrientos, J. Randall Brandt, Peter Sprengelmeyer, and Michael J. Bayly (1989), "Negative-state relief and the empathy-altruism hypothesis," Journal of Personality and Social Psychology, 56 (6), 922-33.

Batson, C. Daniel, Janine L. Dyck, J. Randall Brandt, Judy G. Batson, Anne L. Powell, M. Rosalie McMaster, and Cari Griffit (1988), "Five studies testing two new egoistic alternatives to the empathy-altruism hypothesis," Journal of Personality and Social Psychology, 55 (1), 52-77.

Batson, C. Daniel, Tricia R. Klein, Lori Highberger, and Laura L. Shaw (1995), "Immorality from empathy-induced altruism: When compassion and justice conflict," Journal of Personality and Social Psychology, 68 (6), 1042-54.

Batson, C. Daniel and Tecia Moran (1999), "Empathy-induced altruism in a prisoner's dilemma," European Journal of Social Psychology, 29 (7), 909-24.

Batson, C. Daniel, Karen O'Quin, Jim Fultz, Mary Vanderplas, and Alice M. Isen (1983), "Influence of self-reported distress and empathy on egoistic versus altruistic motivation to help," Journal of Personality and Social Psychology, 45 (3), 706-18.

Batson, C. Daniel and Laura L. Shaw (1991), "Evidence for altruism: Toward a pluralism of prosocial motives," Psychological Inquiry, 2 (2), 107-22.

Batson, C. Daniel and Joy L. Weeks (1996), "Mood effects of unsuccessful helping: Another test of the empathy-altruism hypothesis," Personality and Social Psychology Bulletin, 22 (2), 148-57.

Bauman, Kathleen P. and Glenn Geher (2002), "We think you agree: The detrimental impact of the false consensus effect on behavior," Current Psychology, 21 (4), 293-318.

Beck, John H. (1994), "An experimental test of preferences for the distribution of income and individual risk aversion," Eastern Economic Journal, 20 (2), 131-45.

Becker, Gary S. (1974), "A theory of social interactions," Journal of Political Economy, 82 (6), 1063-93.

Bell, David E. (1988), "One-switch utility functions and a measure of risk," Management Science, 34 (12), 1416-24.

---- (1995), "Risk, return, and utility," Management Science, 41 (1), 23-30.

Bénabou, Roland and Jean Tirole (2006), "Incentives and prosocial behavior," American Economic Review, 96 (5), 1652-78.

Bennett, Charles, Svenn Lindskold, and Russell Bennett (1973), "Effects of group size and discussion time on risky shift," Journal of Social Psychology, 91 (1), 137-47.

Berg, Joyce E., John Dickhaut, and Kevin McCabe (2005), "Risk preference instability across institutions: A dilemma," Proceedings of the National Academy of Sciences, 102 (11), 4209-14.

Bewley, Truman F. (2002), "Knightian decision theory: Part I," Decisions in Economics and Finance, 25 (2), 79-110.

Binswanger, Hans P. (1980), "Attitudes toward risk: Experimental measurement in rural India," American Journal of Agricultural Economics, 62 (3), 395-407.

---- (1981), "Attitudes toward risk: Theoretical implications of an experiment in rural India," Economic Journal, 91 (364), 867-90.

Bishop, John A., J. Howard Finch, and John P. Formby (1990), "Risk aversion and rent-seeking redistributions: Free agency in the National Football League," Southern Economic Journal, 57 (1), 114-24.

Black, Duncan (1948), "On the rationale of group decision-making," The Journal of Political Economy, 56 (1), 23-34.

Bohlmann, Jonathan D. , José Antonio Rosa, Ruth N. Bolton, and William J. Qualls (2006), "The effect of group interactions on satisfaction judgments: Satisfaction escalation," Marketing Science, 25 (4), 301-21.

Bordley, Robert F. (1983), "A Bayesian model of group polarization," Organizational Behavior and Human Performance, 32 (2), 262-74.

Bray, Robert M. and Audrey M. Noble (1978), "Authoritarianism and decisions of mock juries: Evidence of jury bias and group polarization," Journal of Personality and Social Psychology, 36 (12), 1424-30.

Brown, Roger (1965), Social Psychology. New York: Free Press.

Burnstein, Eugene and Amiram Vinokur (1977), "Persuasive argumentation and social comparison as determinants of attitude polarization," Journal of Experimental Social Psychology, 13 (4), 315-32.

Camerer, Colin and Richard H. Thaler (2003), "In honor of Matthew Rabin: Winner of the John Bates Clark Medal," Journal of Economic Perspectives, 17 (3), 159-76.

Chakravarty, Sujoy, Glenn W. Harrison, Ernan E. Haruvy, and E. Elisabet Rutström (2005), "Are you risk averse over other people's money?," in IIMA Working Papers Indian Institute of Management Ahmedabad, Research and Publication Department

Chandler, Shelly and Jerome Rabow (1969), "Ethnicity and acquaintance as variables in risk-taking," Journal of Social Psychology, 77 (2), 221-29.

Cline, Rebecca J. and Timothy R. Cline (1980), "A structural analysis of risky-shift and cautious-shift discussions: The diffusion-of-responsibility theory," Communication Quarterly, 28 (4), 26-36.

Congleton, Roger D. (2003), "The median voter model," in The Encyclopedia of Public Choice, Charles K. Rowley and Friedrich Schneider, Eds.: Kluwer Academic Press.

Cox, James C. and Vjollca Sadiraj (2006), "Small- and large-stakes risk aversion: Implications of concavity calibration for decision theory," Games and Economic Behavior, 56 (1), 45-60.

Dana, Jason, Roberto A. Weber, and Jason Xi Kuang (2007), "Exploiting moral wiggle room: Experiments demonstrating an illusory preference for fairness," Economic Theory, 33 (1), 67-80.

Darley, John M. and Bibb Latané (1968), "Bystander intervention in emergencies: Diffusion of responsibility," Journal of Personality and Social Psychology, 8 (4), 377-83.

Daruvala, Dinky (2007), "Gender, risk and stereotypes," Journal of Risk and Uncertainty, 35 (3), 265–83.

Dave, Chetan, Catherine Eckel, Cathleen Johnson, and Christian Rojas (2008), "Eliciting Risk Preferences: When is Simple Better?," in CBEES Working Papers: University of Texas at Dallas.

Davis, Harry L. (1976), "Decision making within the household," Journal of Consumer Research, 2, 241-60.

Davis, James H. (1973), "Group decision and social interaction: A theory of social decision schemes," Psychological Review, 80 (2), 97-125.

Davis, James H., Norbert Kerr, Mario Sussmann, and A. Kent Rissman (1974), "Social decision schemes under risk," Journal of Personality and Social Psychology, 30 (2), 248-71.

Davis, Mark H. (1983), "Measuring individual differences in empathy: Evidence for a multidimensional approach," Journal of Personality and Social Psychology, 44 (1), 113-26.

---- (1980), "A multidimensional approach to individual differences in empathy," JSAS Catalog of Selected Documents in Psychology, 10 (85).

Deacon, Robert and Perry Shapiro (1975), "Private preference for collective goods revealed through voting on referenda," American Economic Review, 65 (5), 943-55.

Decety, Jean and Philip L. Jackson (2004), "The functional architecture of human empathy," Behavioral And Cognitive Neuroscience Reviews, 3 (2), 71-100.

Dowling, Grahame R. and Richard Staelin (1994), "A model of perceived risk and intended risk-handling activity," Journal of Consumer Research, 21 (1), 119-34.

Eckel, Catherine C. and Philip J. Grossman (1996), "Altruism in anonymous dictator games," Games and Economic Behavior, 16 (2), 181-91.

---- (2008), "Forecasting risk attitudes: An experimental study using actual and forecast gamble choices," Journal of Economic Behavior and Organization, 68 (1), 1-17.

---- (2002), "Sex differences and statistical stereotyping in attitudes toward financial risk," Evolution and Human Behavior, 23 (4), 281-95.

Eckel, Catherine and Charles A. Holt (1989), "Strategic voting in agenda-controlled committee experiments," American Economic Review, 79 (4), 763-73.

Einhorn, Hillel J. and Robin M. Hogarth (1986), "Decision making under ambiguity," Journal of Business, 59 (4), S225-S50.

Eisenhauer, Joseph G. and Luigi Ventura (2003), "Survey measures of risk aversion and prudence," Applied Economics, 35 (13), 1477-84.

El-Shinnawy, Maha and Ajay S. Vinze (1998), "Polarization and persuasive argumentation: A study of decision making in group settings," MIS Quarterly, 22 (2), 165-98.

Eliaz, Kfir, Debray Ray, and Ronny Razin (2006), "Choice shifts in groups: A decision-theoretic basis," American Economic Review, 96 (4), 1321-32.

Ellsberg, Daniel (1961), "Risk, ambiguity, and the savage axioms," Quarterly Journal of Economics, 75 (4), 643-69.

Erdem, Tülin and Michael P. Keane (1996), "Decision-making under uncertainty: Capturing dynamic brand choice processes in turbulent consumer goods markets," Marketing Science, 15 (1), 1-20.

Erdem, Tülin and Joffre Swait (2004), "Brand credibility, brand consideration, and choice," Journal of Consumer Research, 31 (1), 191-98.

---- (1998), "Brand equity as a signaling phenomenon," Journal of Consumer Psychology, 7 (2), 131-57.

Erdem, Tülin, Joffre Swait, and Ana Valenzuela (2006), "Brands as signals: A cross-country validation study," Journal of Marketing, 70 (1), 34-49.

Etzel, Joset A., Valeria Gazzola, and Christian Keysers (2008), "Testing simulation theory with cross-modal multivariate classification of fMRI data," PLoS ONE, 3 (11), e3690-e90.

Forsythe, Robert, Joel L. Horowitz, N. E. Savin, and Martin Sefton (1994), "Fairness in simple bargaining experiments," Games and Economic Behavior, 6 (3), 347-69.

Fraser, Colin, Celia Gouge, and Michael Billig (1971), "Risky shifts, cautious shifts, and group polarization," European Journal of Social Psychology, 1 (1), 7-30.

Gallese, Vittorio (2001), "The 'shared manifold' hypothesis: From mirror neurons to empathy," Journal of Consciousness Studies, 8 (5-7), 33-50.

Gazzola, Valeria and Christian Keysers (2009), "The observation and execution of actions share motor and somatosensory voxels in all tested subjects: Single-subject analyses of unsmoothed fMRI data," Cerebral Cortex, 19 (6), 1239-55.

Gazzola, Valeria, Lisa Aziz-Zadeh, and Christian Keysers (2006), "Empathy and the somatotopic auditory mirror system in humans," Current Biology, 16 (18), 1824-29.

Gershoff, Andrew D., Ashesh Mukherjee, and Anirban Mukhopadhyay (2008), "What's not to like? Preference asymmetry in the false consensus effect," Journal of Consumer Research, 35 (1), 119-25.

Gilboa, Itzhak and David Schmeidler (1989), "Maxmin expected utility with non-unique prior," Journal of Mathematical Economics, 18 (2), 141-53.

Grewal, Dhruv, Jerry Gotlieb, and Howard Marmorstein (1994), "The moderating effects of message framing and source credibility on the price-perceived risk relationship," Journal of Consumer Research, 21 (1), 145-53.

Haley, Kevin J. and Daniel M. T. Fessler (2005), "Nobody's watching? Subtle cues affect generosity in an anonymous economic game," Evolution and Human Behavior, 26 (3), 245-56.

Harbaugh, William T., Ulrich Mayr, and Daniel R. Burghart (2007), "Neural responses to taxation and voluntary giving reveal motives for charitable donations," Science, 316 (5831), 1622-25.

Harrison, Glenn W., Morten Igel Lau, E. Elisabet Rutström, and Marcela Tarazona-Gomez (2005), "Preferences over social risk," in Discussion Paper: CEBR.

Harrison, Glenn W. and Tanga McDaniel (2008), "Voting games and computational complexity," Oxford Economic Papers, 60 (3), 546-65.

Hastie, Reid and Kenneth A. Rasinski (1988), "The concept of accuracy in social judgment," in The Social Psychology of Knowledge, Daniel Bar-Tal and Arie W. Kruglanski, Eds. Cambridge, England: Cambridge University Press.

Heilman, Carrie M., Douglas Bowman, and Gordon P. Wright (2000), "The evolution of brand preferences and choice behaviors of consumers new to a market," Journal of Marketing Research, 37 (2), 139-55.

Hoffman, Elizabeth, Kevin McCabe, Keith Shachat, and Vernon Smith (1994), "Preferences, property rights, and anonymity in bargaining games," Games and Economic Behavior, 7 (3), 346-80.

Hoffman, Elizabeth, Kevin McCabe, and Vernon L. Smith (1996), "Social distance and other-regarding behavior in dictator games," American Economic Review, 86 (3), 653-60.

Holt, Charles A. and Lisa R. Anderson (1999), "Agendas and strategic voting," Southern Economic Journal, 65 (3), 622-29.

Holt, Charles A. and Susan K. Laury (2002), "Risk aversion and incentive effects," American Economic Review, 92 (5), 1644-55.

Hori, Hajime (2009), "Nonpaternalistic altruism and functional interdependence of social preferences," Social Choice and Welfare, 32 (1), 59-77.

Hsee, Christopher K. and Elke U. Weber (1997), "A fundamental prediction error: Self-others discrepancies in risk preference," Journal of Experimental Psychology: General, 126 (1), 45-53.

Hsee, Christopher K. and Elke U. Weber (1999), "Cross-national differences in risk preference and lay predictions," Journal of Behavioral Decision Making, 12 (2), 165-79.

Hubbard, Raymond and J. Scott Armstrong (1994), "Replications and extensions in marketing: Rarely published but quite contrary," International Journal of Research in Marketing, 11 (3), 233-48.

Hunt, Shelby D. (2002), Foundations of Marketing Theory: Toward a General Theory of Marketing. Armonk, New York: M. E. Sharpe.

Iacoboni, Marco, Roger P. Woods, Marcel Brass, Harold Bekkering, John C. Mazziotta, and Giacomo Rizzolatti (1999), "Cortical mechanisms of human imitation," Science, 286 (5449), 2526-28.

Isaac, R. Mark and Duncan James (2000), "Just who are you calling risk averse?," Journal of Risk and Uncertainty, 20 (2), 177-87.

Isenberg, Daniel J. (1986), "Group polarization: A critical review and meta-analysis," Journal of Personality and Social Psychology, 50 (6), 1141-51.

Jabbi, Mbemba, Marte Swart, and Christian Keysers (2007), "Empathy for positive and negative emotions in the gustatory cortex," Neuroimage, 34 (4), 1744-53.

John, Deborah Roedder (1999), "Consumer socialization of children: A retrospective look at twenty-five years of research," Journal of Consumer Research, 26 (3), 183-213.

Johnson, Daniel L. and I. Robert Andrews (1971), "Risky shift phenomenon tested with consumer products as stimuli," Journal of Personality and Social Psychology, 20 (3), 382-85.

Jones, Edward E. and Victor A. Harris (1967), "The attribution of attitudes," Journal of Experimental Social Psychology, 3 (1), 1-24.

Jones, Linda M. and Natalie Norman Foshay (1984), "Diffusion of responsibility in a nonemergency situation: Response to a greeting from a stranger," Journal of Social Psychology, 123 (2), 155-58.

Jones, Paul E. and Peter H. M. P. Roelofsma (2000), "The potential for social contextual and group biases in team decision-making: Biases, conditions and psychological mechanisms," Ergonomics, 43 (8), 1129-52.

Kachelmeier, Steven J. and Mohamed Shehata (1992), "Examining risk preferences under high monetary incentives: Experimental evidence from the People's Republic of China," American Economic Review, 82 (5), 1120-41.

Kahneman, Daniel (2003), "A psychological perspective on economics," American Economic Review, 93 (2), 162-68.

---- (1992), "Reference points, anchors, norms, and mixed feelings," Organizational Behavior and Human Decision Processes, 51 (2), 296-312.

Kahneman, Daniel and Amos Tversky (1979), "Prospect theory: An analysis of decision under risk," Econometrica, 47 (2), 263-91.

Kahneman, Daniel, Jack L. Knetsch, and Richard H. Thaler (1986), "Fairness and the assumptions of economics," Journal of Business, 59 (4), S285-S300.

Kahneman, Daniel and Amos Tversky (1984), "Choices, values, and frames," American Psychologist, 39 (4), 341-50.

---- (1973), "On the psychology of prediction," Psychological Review, 80 (4), 237-51.

Kamalanabhan, T. J., D. L. Sunder, and M. Vasanthi (2000), "An evaluation of the choice dilemma questionaire as a measure of risk-taking propensity," Social Behavior and Personality, 28 (2), 149-56.

Keller, Kevin Lane (1993), "Conceptualizing, measuring, and managing customer-based brand equity," Journal of Marketing, 57 (1), 1-22.

Keller, L. Robin, Rakesh K. Sarin, and Jayavel Sounderpandian (2007), "An examination of ambiguity aversion: Are two heads better than one?," Judgment and Decision Making, 2 (6), 390-97.

Kerr, Norbert L., Robert J. MacCoun, and Geoffrey P. Kramer (1996), "Bias in judgment: Comparing individuals and groups," Psychological Review, 103 (4), 687-719.

Kerr, Norbert L., Keith E. Niedermeier, and Martin F. Kaplan (1999), "Bias in jurors vs bias in juries: New evidence from the SDS perspective," Organizational Behavior and Human Decision Processes, 80 (1), 70–86.

Kirchler, Erich and Eva Hofmann (2006), "Economic decisions in the private household," in Handbook of Contemporary Behavioral Economics: Foundations and Developments, Morris Altman, Ed. New York: M.E. Sharpe.

Kogan, Nathan and Michael A. Wallach (1967), "Risky-shift phenomenon in small decision-making groups: A test of the information-exchange hypothesis," Journal of Experimental Social Psychology, 3 (1), 75-84.

Kroll, Yoram and Liema Davidovitz (2003), "Inequality aversion versus risk aversion," Economica, 70 (277), 19-29.

Lamm, Claus, C. Daniel Batson, and Jean Decety (2007), "The neural substrate of human empathy: Effects of perspective-taking and cognitive appraisal," Journal of Cognitive Neuroscience, 19 (1), 42-58.

Leclerc, France, Bernd H. Schmitt, and Laurette Dubé (1995), "Waiting time and decision making: Is time like money?," Journal of Consumer Research, 22 (1), 110-19.

Leone, Robert P. and Randall L. Schultz (1980), "A study of marketing generalizations," Journal of Marketing, 44 (1), 10-18.

Levitt, Steven D. and John A. List (2007a), "Viewpoint: On the generalizability of lab behaviour to the field," Canadian Journal of Economics, 40 (2), 347-70.

---- (2007b), "What do laboratory experiments measuring social preferences reveal about the real world?," Journal of Economic Perspectives, 21 (2), 153-74.

List, John A. (2007), "On the interpretation of giving in dictator games," Journal of Political Economy, 115 (3), 482-93.

Loewenstein, George F., Elke U. Weber, Christopher K. Hsee, and Ned Welch (2001), "Risk as feelings," Psychological Bulletin, 127 (2), 267–86.

Luhan, Wolfgang J., Martin G. Kocher, and Matthias Sutter (2009), "Group polarization in the team dictator game reconsidered," Experimental Economics, 12 (1), 26-41.

Lusk, Jayson L. and Keith H. Coble (2004), "Risk aversion in the presence of background risk: Evidence from the lab."

Lutz, Nancy A. and V. Padmanabhan (1995), "Why do we observe minimal warranties?," Marketing Science, 14 (4), 417-41.

Mandel, Naomi (2003), "Shifting selves and decision making: The effects of self-construal priming on consumer risk-taking," Journal of Consumer Research, 30 (1), 30-40.

Markus, Hazel Rose and Shinobu Kitayama (1991), "Culture and the self: Implications for cognition, emotion, and motivation," Psychological Review, 98 (2), 224-53.

Marquis, Donald G. (1962), "Individual responsibility and group decision involving risk," Industrial Management Review, 3 (2), 8-23.

Masclet, David, Nathalie Colombier, Laurent Denant-Boemont, and Youenn Lohéac (2009), "Group and individual risk preferences: A lottery-choice experiment with self-employed and salaried workers," Journal of Economic Behavior & Organization, 70 (3), 470-84.

Menezes, C. F. and D. L. Hanson (1970), "On the theory of risk aversion," International Economic Review, 11 (3), 481-87.

Moll, Jorge, Frank Krueger, Roland Zahn, Matteo Pardini, Ricardo de Oliveira-Souzat, and Jordan Grafman (2006), "Human fronto-mesolimbic networks guide decisions about charitable donation," Proceedings of the National Academy of Sciences of the United States of America, 103 (42), 15623-28.

Morris, Louis A., John L. Swasy, and Michael B. Mazis (1994), "Accepted risk and alcohol use during pregnancy," Journal of Consumer Research, 21 (1), 135-44.

Morrongiello, Barbara A., Jennifer Lasenby-Lessard, and Michael Corbett (2009), "Children's risk taking in a gambling task and injury-risk situation: Evidence for domain specificity in risk decisions," Personality and Individual Differences, 46 (3), 298-302.

Moscovici, Serge and Marisa Zavalloni (1969), "The group as a polarizer of attitudes," Journal of Personality and Social Psychology, 12 (2), 125-35.

Murnighan, J. Keith, John M. Oesch, and Madan Pillutla (2001), "Player types and self-impression management in dictatorship games: Two experiments," Games and Economic Behavior, 37 (2), 388-414.

Myers, David G. and George D. Bishop (1970), "Discussion effects on racial attitudes," Science, 169 (947), 778-79.

Myers, David G. and Martin F. Kaplan (1976), "Group-induced polarization in simulated juries," Personality and Social Psychology Bulletin, 2 (1), 63-66.

Myers, David G. and Helmut Lamm (1976), "The group polarization phenomenon," Psychological Bulletin, 83 (4), 602-27.

Nagel, Thomas (1979), The Possibility of Altruism: Princeton University Press.

Ogaki, Masao and Qiang Zhang (2001), "Decreasing relative risk aversion and tests of risk sharing," Econometrica, 69 (2), 515-26.

Okada, Erica Mina and Stephen J. Hoch (2004), "Spending time versus spending money," Journal of Consumer Research, 31 (2), 313-23.

Padmanabhan, V. and Ram C. Rao (1993), "Warranty policy and extended service contracts: Theory and an application to automobiles," Marketing Science, 12 (3), 230-47.

Parducci, Allen and Douglas H. Wedell (1986), "The category effect with rating scales: number of categories, number of stimuli, and method of presentation," Journal of Experimental Psychology: Human Perception and Performance, 12 (4), 496-516.

Peterson, Robert A. and William Wilson (1985), "Perceived risk and price-reliance schema as price-perceived quality mediators," in Perceived Quality: How Consumers View Stores and Merchandise, Jacob Jacoby and Jerry C. Olson, Eds. Lexington, MA: Lexington Books.

Pollak, Robert A. (1988), "Tied transfers and paternalistic preferences," American Economic Review, 78 (2), 240-44.

Powell, Melanie and David Ansic (1997), "Gender differences in risk behaviour in financial decision-making: An experimental analysis," Journal of Economic Psychology, 18 (6), 605-28.

Pratt, John W. (1964), "Risk aversion in the small and in the large," Econometrica, 32 (1-2), 122-36.

Preston, Stephanie D. and Frans B. M. de Waal (2002), "Empathy: Its ultimate and proximate bases," Behavioral and Brain Sciences, 25 (1), 1-72.

Pruitt, Dean G. (1971a), "Choice shifts in group discussion: An introductory review," Journal of Personality and Social Psychology, 20 (3), 339-60.

---- (1971b), "Conclusions: Toward an understanding of choice shifts in group discussion," Journal of Personality and Social Psychology, 20 (3), 495-510.

Rabin, Matthew and Richard H. Thaler (2001), "Anomalies: Risk aversion," Journal of Economic Perspectives, 15 (1), 219-32.

Rabow, Jerome, Floyd J. Fowler, Jr., David L. Bradford, Margret A. Hofeller, and Yuriko Shibuya (1966), "The role of social norms and leadership in risk-taking," Sociometry, 29 (1), 16-27.

Rao, Vithala R. and Joel H. Steckel (1991), "A polarization model for describing group preferences," Journal of Consumer Research, 18 (1), 108-18.

Rawls, John H. (1971), A Theory of Justice: Harvard University Press.

Reingen, Peter H. (1974), "Comment on Woodside," Journal of Marketing Research, 11 (2), 223-24.

Ross, Lee, David Greene, and Pamela House (1977), "The 'false consensus effect': Egocentric bias in social-perception and attribution processes," Journal of Experimental Social Psychology, 13 (3), 279-301.

Rubinstein, Mark (1974), "An aggregation theorem for securities markets," Journal of Financial Economics, 1 (3), 225-44.

Ruchala, Linda V., John W. Hill, and Dan Dalton (1996), "Escalation and the diffusion of responsibility: A commercial lending experiment," Journal of Business Research, 37 (1), 15-26.

Rutström, E. Elisabet and Melonie B. Williams (2000), "Entitlements and fairness: An experimental study of distributive preferences," Journal of Economic Behavior & Organization 43 (1), 75-89.

Saha, Atanu (1993), "Expo-power utility: A 'flexible' form for absolute and relative risk aversion," American Journal of Agricultural Economics, 75 (4), 905-13.

Saha, Atanu, C. Richard Shumway, and Hovav Talpaz (1994), "Joint estimation of risk preference structure and technology using expo-power utility," American Journal of Agricultural Economics, 76 (2), 173-84.

Sanders, Glenn S. and Robert S. Baron (1977), "Is social comparison irrelevant for producing choice shifts?," Journal of Experimental Social Psychology, 13 (4), 303-14.

Savage, Leonard J. (1954), The Foundations of Statistics. New York: Wiley.

Schubert, Renate, Martin Brown, Matthias Gysler, and Hans Wolfgang Brachinger (1999), "Financial decision-making: Are women really more risk-averse?," American Economic Review, 89 (2), 381-85.

Shellman, Erin R. (2005), "Gender differences in risk aversion and competitiveness: Evidence from eBay's buy-it-now option," Case Western Reserve University.

Shimp, Terence A. and William O. Bearden (1982), "Warranty and other extrinsic cue effects on consumers' risk perceptions," Journal of Consumer Research, 9 (1), 38-46.

Shupp, Robert S. and Arlington W. Williams (2008), "Risk preference differentials of small groups and individuals," Economic Journal, 118 (525), 258-83.

Siegrist, Michael, George Cvetkovich, and Heinz Gutscher (2002), "Risk preference predictions and gender stereotypes," Organizational Behavior and Human Decision Processes, 87 (1), 91–102.

Singelis, Theodore M. (1994), "The measurement of independent and interdependent self-construals," Personality and Social Psychology Bulletin, 20 (5), 580-91.

Smith, Vernon L. (1982), "Microeconomic systems as an experimental science," American Economic Review, 72 (5), 923-55.

Soane, Emma and Nik Chmiel (2005), "Are risk preferences consistent?: The influence of decision domain and personality," Personality and Individual Differences, 38 (8), 1781-91.

Soman, Dilip (2001), "The mental accounting of sunk time costs: Why time is not like money," Journal of Behavioral Decision Making, 14 (3), 169-85.

Srinivasan, Narasimhan and Brian T. Ratchford (1991), "An empirical test of a model of external search for automobiles," Journal of Consumer Research, 18 (2), 233-42.

Stern, Bruce L. and Gregory M. Gazda (1975), "Risky shift: An empirical investigation and implications for industrial buying behavior and marketing management," Journal of the Academy of Marketing Science, 3 (3), 287-95.

Stone, Eric R., Andrew J. Yates, and Allison S. Caruthers (2002), "Risk taking in decision making for others versus the self," Journal of Applied Social Psychology, 32 (9), 1797-824.

Stoner, James A. F. (1968), "Risky and cautious shifts in group decisions: The influence of widely held values," Journal of Experimental Social Psychology, 4 (4), 442-59.

Stoner, James Arthur Finch (1961), "A comparison of individual and group decisions involving risk," Massachusetts Institute of Technology.

Tellis, Gerard J. and Gary J. Gaeth (1990), "Best value, price-seeking, and price aversion: The impact of information and learning on consumer choices," Journal of Marketing, 54 (2), 34-45.

Trafimow, David, Harry C. Triandis, and Sharon G. Goto (1991), "Some tests of the distinction between the private self and the collective self," Journal of Personality and Social Psychology, 60 (5), 649-55.

Tversky, Amos and Daniel Kahneman (1983), "Extensional versus intuitive reasoning: The conjunction fallacy in probability judgment," Psychological Review, 90 (4), 293-315.

von Neumann, John and Oskar Morgenstern (1944), Theory of Games and Economic Behaviour. Princeton, NJ: Princeton University Press.

Wallach, Michael A. and Nathan Kogan (1965), "The roles of information, discussion, and consensus in group risk taking," Journal of Experimental Social Psychology, 1 (1), 1-19.

Wallach, Michael A., Nathan Kogan, and Daryl J. Bem (1964), "Diffusion of responsibility and level of risk raking in groups," Journal of Abnormal and Social Psychology, 68, 263-74.

---- (1962), "Group influence on individual risk taking," Journal of Abnormal and Social Psychology, 65 (2), 75-86.

Weber, Elke U., Ann-Renée Blais, and Nancy E. Betz (2002), "A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors," Journal of Behavioral Decision Making, 15 (4), 263-90.

Weibull, Jörgen W. (2004), "Testing game theory," in Advances in Understanding Strategic Behaviour: Game Theory, Experiments and Bounded Rationality, Steffen Huck, Ed.: Palgrave Macmillan.

White, J. Dennis and Elise L. Truly (1989), "Price-quality integration in warranty premium," Journal of Business Research, 19 (9), 109-25.

Whitney, John C. and Ruth A. Smith (1983), "Effects of group cohesiveness on attitude polarization and the acquisition of knowledge in a strategic planning context," Journal of Marketing Research, 20 (2), 167-76.

Wiesenthal, David L., Douglas Austrom, and Irwin Silverman (1983), "Diffusion of responsibility in charitable donations," Basic and Applied Social Psychology, 4 (1), 17-27.

Wik, Mette, Tewodros Aragie Kebede, Olvar Bergland, and Stein T. Holden (2004), "On the measurement of risk aversion from experimental data," Applied Economics, 36 (21), 2443-51.

Wilson, Robert (1968), "The theory of syndicates," Econometrica, 36 (1), 119-32.

Woodside, Arch G. (1972), "Informal group influence on risk taking," Journal of Marketing Research, 9 (2), 223-25.

---- (1974), "Is there a generalized risky shift phenomenon in consumer behavior?," Journal of Marketing Research, 11 (2), 225-26.

Ybarra, Oscar and David Trafimow (1998), "How priming the private self or collective self affects the relative weights of attitudes and subjective norms," Personality and Social Psychology Bulletin, 24 (4), 362-70.

Zeckhauser, Richard and Emmett Keeler (1970), "Another type of risk aversion," Econometrica, 38 (5), 661-65.

Chapter 4

Group Membership Salience and Persuasion: The Effect of Cultural Salience on Processing Strategies

4.1 Introduction

Social identity theory suggests that a person's identity consists of the feeling of self along with the social identity stemming from social group memberships (Mullen, Migdal, and Rozell 2003; Reed 2004; Tajfel and Turner 1979; Tajfel and Turner 1986). At the highest level of aggregation, cultural identity may be regarded as such a group membership and recent findings propose that this membership has the power to explain attitudinal and behavioural outcomes as well as individuals' information processing strategies (Aaker 2000; Aaker and Sengupta 2000; Briley and Aaker 2001; Briley and Aaker 2006; Lau and Aaker 1998; Nelson et al. 2006). At the same time, further explorations are necessary before a complete picture of the impact of cultural identity on judgment and decision-making can be drawn.

Petty and Cacioppo (1979) and Chaiken (1980) both suggested that individuals use a dual approach when processing information as part of a persuasion attempt. Specifically, individuals can use a heuristic approach, a systematic approach or both when forming attitudes toward products and services. It was recently shown that consumers in both individualistic and collectivistic cultures employ this dual process approach. When the heuristic cue and the attribute information are at odds, however, members of an individualistic culture tend to rely more on attribute information than consensus information (Aaker and Maheswaran 1997). Additionally, it appears as if this difference, at least partly, can be attributed to a difference in the perceived diagnostics of

the heuristic cue. Moreover, when members of an individualistic culture are primed on their cultural identity, they recall their cultural group membership. As a result, a group-mind set is induced, leading individuals to make decisions exhibiting concerns for equality and compromises. In this sense the revealed preferences are closer to the ones often found in collectivistic cultures (Briley and Wyer 2002). However, an unresolved issue is if imposing cultural salience, such as in Briley and Wyer (2002) and Hong et al. (2000), could remove some of the processing strategy differences between individualistic and collectivistic cultures that Aaker and Maheswaran (1997) identified. Hence, the research objective is to examine whether making individuals' cultural identity salient will shift their information processing strategies, thereby mitigating the difference between individualistic and collectivistic cultures in this respect. This research builds on and integrates the literature on the classification of cultures, dual process models of information processing, and cross-cultural differences in decision-making and information-processing.

The remainder of this chapter is organized in the following way: Section 4.1 presents a literature review of 'The classification of cultural orientation' (4.2.1), 'Dual process models of persuasion' (4.2.2), and finally 'Individualist-collectivist differences in information-processing' (4.2.3). In section 4.3 the 'Hypotheses' are developed, followed by a description of experimental procedures in section 4.4 regarding 'Manipulation of cultural salience' (4.4.1), 'Manipulation of high versus low motivation' (4.4.2), 'Manipulation of high versus low congruency' (4.4.3), and 'Elicitation of participants' responses (4.4.4). Finally, section 4.5 presents the 'Experimental results' and section 4.6 concludes with a 'Summary and discussion'.

4.2 Literature review

4.2.1 The classification of cultural orientation

Consumer research—the study of how various circumstances affect consumer behaviour—ought to pay attention to the one major circumstance: 'culture'. The challenge, however, has been to develop a framework rich enough to capture the essentials of culturally rooted preferences, yet parsimonious enough to make reality apprehensible. An additional concern is to avoid stereotyping. Even so, three efforts to develop cultural classification schemas are noteworthy: Hall (1976; 1969; 1959), Hofstede (1980; 1991; 1998), and Trompenaars and Hampden-Turner (1997).[1]

In Hall's approach, the discriminating cultural traits are two dimensions related to the way information is communicated among individuals and whether individuals tend toward either multitasking or concentrating on one task at a time (Hall 1976; Hall 1969; Hall 1959). The first dimension is used to classify cultures as being either low-, middle-, or high-context. In high-context cultures, individuals rely more on the situational aspects and pre-established traditions when conveying information; consequently, the factual information is limited. Most Western countries would be classified as low-context, meaning that messages contain ample information with little reliance on the context. Conversely, Asian countries are considered to be high-context cultures.[2] The second cultural dimension specifies cultures as being either monochronic or polychronic. In polychronic cultures individuals are believed to engage in several activities at the same

[1] For reviews of the role of culture in international marketing and Hofstede's cultural dimensions see Steenkamp (2001) and Clark (2003).

[2] The difference between high- and low-context cultures has been shown to be evident in the amount of information in print advertisement (Al-Olayan and Karande 2000; Biswas, Olsen, and Carlet 1992).

time. It follows that sticking to the schedule is secondary to maintaining interpersonal relations.[3] The reverse situation is prevailing in monochronic cultures.

Hofstede (1980; 1991; 1998) proposed a classification schema consisting of five dimensions: uncertainty avoidance, power distance, masculinity/femininity, individualism/collectivism, and long-term orientation.[4] Uncertainty avoidance measures to what extent people feel ill at ease in uncertain and ambiguous situations and deliberately try to avoid them. Cultures scoring high on the uncertainty avoidance scale have a disposition to a heavier reliance on formality, rules, and heuristics to create order and structure in life. Further, a high level of the power distance indicates a hierarchical society where subordinate cultural members assume the unequal distribution of power. The degree of femininity (and hence the lack of masculinity) in a society mainly reflects the extent to which 'soft' values such as quality of life and environmental concerns are prevalent and how vague the gender roles are. Long-term orientation primarily captures whether the cultural norms advocate a forward-looking perspective, as opposed to a short-term view. East Asian countries are often regarded as long-term oriented as these cultures promote perseverance and thrift rather than short-term gratification. Accordingly, most Western countries are considered to be short-term oriented.

Of Hofstede's five cultural dimensions the most commonly used in consumer research is undoubtedly the individualism/collectivism dimension. Most often the findings from an individualist country such as the USA are contrasted with those

[3] An interdisciplinary overview of polychromic time use is provided in Kaufman, Lane, and Lindquist (1991).

[4] Hofstede's five cultural dimensions have recently been applied to the study of differences in consumer behaviour across countries, focusing on the implications for international retailing (de Mooij and Hofstede 2002).

obtained in a collectivist country such as China.[5] Yet, it is important to note that several of Hofstede's dimensions are correlated for these countries. For instance, the USA is not simply individualistic; in comparison with China, it scores substantially lower on both power distance, and long-term orientation. Hence, some of the results for these countries could potentially be due to cross-cultural differences other than the individualism-collectivism dimension. Nevertheless, in collectivist cultures the interpersonal ties are firm and considered more important than personal success, leading to a strong group mind-set. Members of individualist cultures instead have weak ties with others, apart from the immediate family and close friends. A way of looking at the difference is to think of the two components comprising a person's identity, as suggested by social identity theory (Tajfel and Turner 1979; Tajfel and Turner 1986). In individualist cultures, the identity has its base in the individual's sense of self, whereas in collectivist cultures the identity is to a greater extent derived from social group memberships.

Trompenaars and Hampden-Turner (1997) recommended seven dimensions; some of these are more or less equivalent to some of Hofstede's dimensions, whereas some have no direct correspondence.[6] In particular, the diffuse-specific value orientation scale has no equivalent in Hofstede's dimensions. Individuals in diffuse cultures have a tendency to look upon situations using a 'top-down approach'. This implies that they start with the whole and see how each item is related to the other items. In specific cultures, on the other hand, individuals start by looking at specific items, analyzing each separately, with the whole being the sum of the items. Table 4-1 presents a rough

[5] See for instance Aaker and Maheswaran (1997), Hsee and Weber (1999), Sosik and Jung (2002), and Briley and Wyer (2002).

[6] Moon and Woolliams (2000) and Draguns (2007) reviewed a great deal of Trompenaars' and Hampden-Turner's cultural value system.

comparison and translation of Hofstede's, Trompenaars' and Hampden-Turner's (THT), and Hall's cultural dimensions.

Table 4-1

A comparison of three cultural schemata

Hofstede	THT	Hall	Explanation
Power distance	Achievement/ Ascription	-	Power distribution
Individualism/ Collectivism	Individualism/ Communitarianism	-	Personal vs. collective wants
Masculinity/ Femininity	-	-	Distinct vs. overlapping gender roles
Uncertainty avoidance	Universalism/ Particularism	-	Reliance on rules and heuristics
Long-term orientation	-	-	Long-term goals vs. tradition
-	-	High/ Low context	Extent of information in messages
-	Human-time relationship	Mono-/ Polychronic	Multi- vs. single-tasking
-	Neutral/Emotional	-	Express feelings openly or not
-	Diffuse/Specific	-	Degree of involvement
-	Human-nature relationship	-	Extent that nature can be controlled

4.2.2 Dual process models of persuasion

The Heuristic Systematic Model (HSM) (Chaiken 1987; Chaiken 1980; Chaiken, Liberman, and Eagly 1989) and the Elaboration Likelihood Model (ELM) (Petty and Cacioppo 1981; Petty and Cacioppo 1986b; Petty and Cacioppo 1986a; Petty and

Cacioppo 1979) suggest that persuasion—and hence attitude change—can be attained via two routes of information processing.[7]

In the HSM, the systematic route to persuasion is described as an all-embracing and analytical reflection of judgment-relevant information. The heuristic route to persuasion, in contrast, is identified as the triggering and application of pre-learned associations stored in memory. An additional requirement is that the stored associations have some relevance for the impendent judgmental problem; often referenced examples state that 'consensus opinions are correct', 'experts can be trusted', 'likable people can be trusted', and so forth. Within the HSM framework, any transmitted information having the potential to activate pre-learned associations are referred to as 'cues', and the default assumption is that the said information is more 'simplistic' or 'clear-cut' than the information entering via the systematic route.[8] More elaborate information, such as comprehensive product specifications, are often labelled 'arguments'. For simplicity these two definitions will be maintained when comparing the two dual process models of persuasion.

In many ways the ELM has an analogous setup to the HSM; for instance, the central route to persuasion is reported as an extensive and onerous processing of information devoted to the unveiling of the central merits of a message. The peripheral route, in turn, is presented as an umbrella term subsuming various attitude change

[7] Detailed reviews of the HSM and ELM are provided in Chen and Chaiken (1999), Petty and Wegener (1999), Petty (1997), Chaiken, Wood, and Eagly (1996), and Eagly and Chaiken (1993).

[8] Common examples are the provision of the percentage of satisfied customers or expert opinions such as 'doctors recommend'; thus, the heuristic cue often has the format of others' final assessments. For examples see Reimer, Mata, and Stoecklin (2004) and Axsom, Yates, and Chaiken (1987). Other heuristic cues are the number of pros versus cons, statements similar in type to 'we will not be undersold', and whether or not grocers carry customers' favourite brand (Broniarczyk, Hoyer, and McAlister 1998).

processes conceived to differ quantitatively and, at times, qualitatively from the central route process. Thus, the type of cognitive activity in the peripheral route could be the same as in the central route, albeit less intensive. This holds, for instance, when individuals regard all arguments in a message but only contemplate a subset of the possible entailments (Petty and Wegener 1999). Instances of attitude change processes differing qualitatively (and quantitatively) are: impact from self-perception (Folkes 1988; Reingen and Kernan 1977), the application of heuristics (Chaiken 1987; Reimer, Mata, and Stoecklin 2004; Tversky and Kahneman 1974), operant and classical conditioning effects (Foxall 1994; Gorn 1982; Janiszewski and Warlop 1993; Stuart, Shimp, and Engle 1987), affect (Ashby, Valentin, and Turken 2002; Bagozzi 1982; Batra and Ray 1986; Baumgartner, Sujan, and Bettman 1992; Loewenstein 2007; Shiv and Fedorikhin 1999), stimulus generalization effects (Burshteyn and Buff 2008), and mere-exposure effects (Bornstein 1989; Fang, Singh, and Ahluwalia 2007; Zajonc 1968).

Comparing the definitions of the HSM's systematic route and the ELM's central route they essentially seem equivalent. Even so, the ELM differs from the HSM in one important aspect; considering the heuristic route, the HSM rules out anything except associations that are activated and retrieved from memory. Consequently, the cognitive activity associated with the heuristic information processing could be read as differing in both intensity and type from the systematic route. As has been illustrated, this does not hold for the ELM's peripheral route; therefore, the ELM should not be interpreted as offering two discrete classes of information processing, but rather a continuum of scrutiny differing in intensity—'the elaboration continuum' (Petty and Cacioppo 1986a). At the lower limit of cognitive activity one could conceptualize it as a peripheral route to persuasion and at the upper limit a central route to persuasion. There are several

implications of this characteristic. To begin with, any external or internal bit of information could potentially be processed either in the peripheral or the central route.[9] The route information will take depends on where in the elaboration continuum the individual is residing. Accordingly, when elaboration likelihood is low, due to lack of motivation and ability, the available information is likely to be processed in the peripheral route. In contrast, when elaboration likelihood is high, both cues and arguments will likely be processed in the central route.

A useful illustration of variables' multiple roles is the number of arguments provided in a message. For instance, Petty and Cacioppo (1984) manipulated the number of arguments in a persuasive message under low versus high motivation. Under low motivation, a threefold increase of the number of arguments heightened persuasion no matter if the provided arguments were relevant or spurious. In contrast, under high motivation increasing the number of arguments resulted in increased persuasion when the arguments were strong but decreased persuasion when the arguments were weak. Similarly, Alba and Marmorstein (1987) varied the number of arguments under conditions of low versus high ability to process product information and hence elaboration likelihood. When ability was high, as in familiarity with the product class, increasing the number of weak arguments resulted in a less positive attitude toward the brand, whereas participants with low ability instead tended to be persuaded. Hence, the ELM clearly distinguishes between the type of information, on the one hand, and the information processing route, on the other hand. This is contrary to the HSM where the assumption of the originators and followers appears to be that predefined cues will

[9] This is explicitly stated in Postulate 3 in Petty and Cacioppo (1986a).

always be processed in the heuristic route (Aaker and Maheswaran 1997; Chaiken 1987; Chaiken, Wood, and Eagly 1996; Chen and Chaiken 1999). Paraphrasing this quality it means that the ELM allows for individuals to have advanced thoughts on simplistic information, whereas the HSM does not. Unfortunately, this important difference is frequently glossed over or, in some cases, misunderstood.

As the HSM puts an identity between the cue/argument distinction and heuristic/systematic dichotomy, conclusions regarding which information processing route that was active are inferred from the generation of cue-related and argument-related thoughts.[10] Hence, in the HSM it is believed that heuristic processing may co-occur with systematic processing, both exerting independent effects on attitudes. Hypothetically one could think of five situations identified by which information processing route was used and the corresponding attitude outcome: (I) heuristic processing alone, (II) systematic processing alone, (III) both simultaneously, (IV) both simultaneously but systematic processing overriding heuristic processing, and (V) both simultaneously but heuristic processing overriding systematic processing. Case (III) is known in the literature as 'additivity' (Aaker and Maheswaran 1997; Chaiken, Liberman, and Eagly 1989; Chaiken and Maheswaran 1994), and is believed to occur in situations where the cue and argument are congruous. Cases (IV) and (V) could both be labelled 'attenuation', but this term has traditionally been used for the former case and is thought to arise in circumstances in which the cue and argument are at odds (Aaker and Maheswaran 1997). Table 4-2 presents the information processing strategies and attitude outcomes of the HSM.

[10] This technique is referred to as 'thought-listing' (Brock 1967; Greenwald 1968).

Table 4-2

Information processing strategies and attitude outcomes of the HSM

	-	SP—A
	Attitude outcomes	
HP—C	C (I)	CA (III) cA (IV) Ca (V)
-	-	A (II)

HP—C: Heuristic processing—use of cue

SP—A: Systematic processing—use of argument

Lower case letters (c versus a) signifies lesser attitude impact of cue versus argument

I: Only heuristic information processing

II: Only systematic information processing

III: Both heuristic and systematic information processing—additivity

IV: Both heuristic and systematic information processing—attenuation of the cue

V: Both heuristic and systematic information processing—attenuation of the argument

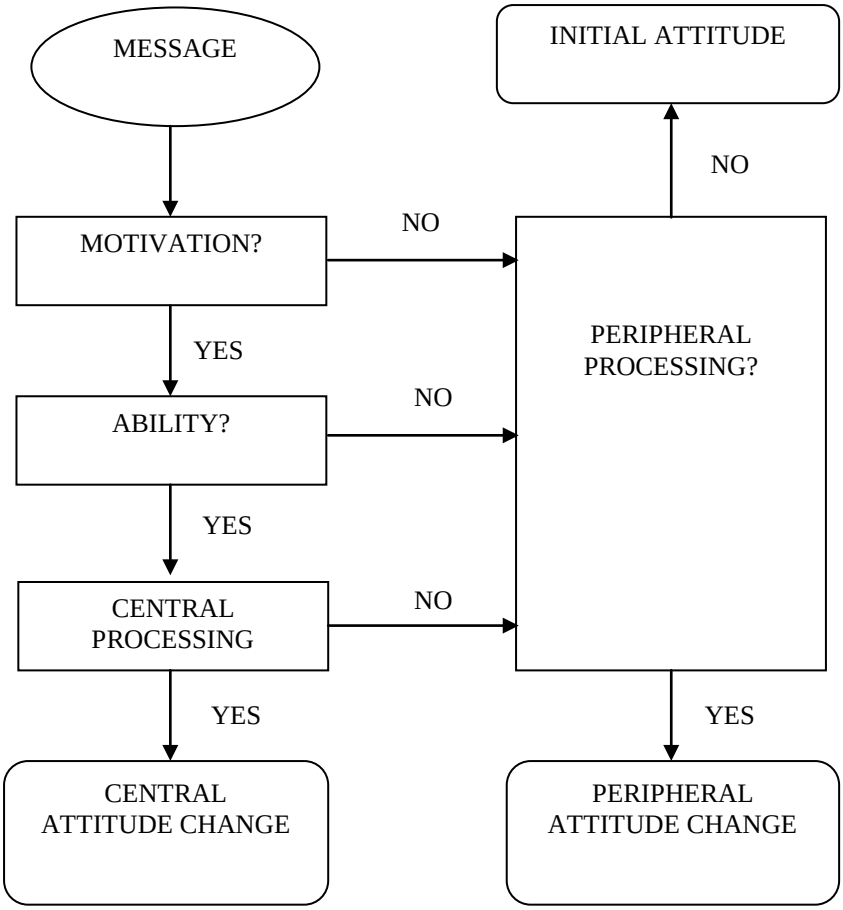
For the ELM the situation is quite different in the sense that the predefined type of information has little to do with information processing route; any bit of information (i.e. cue or argument according to the HSM's definition) could be processed in the peripheral or the central route in the ELM framework. Thus, the HSM's hypotheses concerning attenuation and additivity have little bearing in the ELM, at least with regards to information processing strategies. Instead they are strictly interpreted as hypotheses with regards to what information source (e.g. experts' statements versus product attribute information) had an impact on the attitude outcome under various conditions. However, with decreasing motivation and ability—and consequently lessened elaboration likelihood—all variables are more likely to impact attitudes via the peripheral process. Conversely, when elaboration likelihood increases, all variables are more likely to impact

attitudes through the central process. Hence, in comparison with the HSM, the ELM is a somewhat 'silent' in regards to the possibility of the concurrent operation of both routes to persuasion. On the other hand, if individuals are provided with simplistic cues together with more detailed arguments, then the HSM would predict that the cue would enter via the heuristic route and the argument via the systematic route. However, even if the cue happens to be simplistic and the argument more detailed, one could easily think of situations where individuals would spend significant cognitive efforts in trying to reconcile these two pieces of information and it would be difficult to establish that two separate routes were in use. Hence, even though the HSM allows parallel routes to persuasion, in some ways the ELM could be regarded a more general information model because it allows for variables to play multiple roles. Figure 4-1 presents a simplified outline of the main components of the ELM.[11]

[11] For a full pictorial outline of the ELM see Petty and Cacioppo (1986a).

Figure 4-1

A simplified outline of the Elaboration Likelihood Model



Notwithstanding the differences between the HSM and the ELM, the core propositions of the two models are similar and in practice they are often treated as interchangeable; in particular, (1) both the HSM and the ELM assume that people are motivated to hold accurate attitudes, (2) both the HSM and the ELM conceptualize two routes of information processing where one is more elaborate than the other, and finally (3) both

the HSM and the ELM suggest that the likelihood the central/systematic routes will be in use depends on motivation and the available cognitive capacity. Generally speaking, the dual process models of persuasion have gained wide acceptance in the research community today (Aaker and Maheswaran 1997; Aaker and Sengupta 2000; Petty, Cacioppo, and Goldman 1981; Reimer, Mata, and Stoecklin 2004).

Even so, there have been attempts to develop alternative models advocating a more parsimonious description of information processing, such as the Unimodel (Chun, Spiegel, and Kruglanski 2002; Erb et al. 2003; Kruglanski et al. 2003; Kruglanski and Thompson 1999). Note that both the HSM and in some circumstances the ELM suggest that the nature of the information processing occurring in the heuristic and peripheral route is qualitatively different than the one occurring in the systematic and central route; hence, 'dual process models of persuasion'. The Unimodel, in lieu of these, purports that there is only one type of information processing and regards the two persuasive modes in HSM and ELM as special cases of the same process, albeit less intense.

4.2.3 Individualist-collectivist differences in information-processing

Culture has traditionally been regarded as a static disposition inherently wired into individuals, and this view spurred the development of the cultural orientation scales. With regards to culture's impact on judgment and decision-making, an often cited reference is McCracken's description of culture as comprised of a lens through which people perceive society (1986). However, research in the field of consumer behaviour during the past decade or so has gradually altered this view; consequently, culture is no longer regarded as exerting a static and omnipresent impact on decision-making but rather exhibiting a dynamic effect. For instance, this research has sought to establish

under what circumstances culture's lens is in use and when it is being overridden by idiosyncratic personal knowledge. The lion's share of this research has adopted the individualist-collectivist framework as a starting point. Subsequently, efforts have been made to show that members of individualist cultures, at least seemingly, can be 'transformed' into collectivist individuals, exhibiting similar behaviour to those found in collectivist cultures.

Retreating back to the static view of culture, there is still a respectable amount of evidence suggesting that the individualist-collectivist cultural dichotomy has something to say about individual-level consumption goals and decision-making processes. In particular, when comparing members of individualist cultures against members of collectivist cultures, the latter group have been found to exhibit a pronounced group mind-set (Briley and Wyer 2002; Singelis 1994; Triandis 1989). In the salient group mind-set, opinions and anticipated outcomes of others tend to be factored in the decision process, resulting in an increased tendency for equality and willingness to compromise. Also, the group mind-set, in which peer-approval is important, will impact individuals' propensities to make choices subject to minimizing the risk of losing face and experiencing negative outcomes. This prevention focus is in stark contrast to the promotion focus often observed among members of individualist cultures, where the possibility for gains, promotions and aspirations is explored (Briley and Aaker 2006; Lee and Aaker 2004; Lee, Aaker, and Gardner 2000).

The work of Briley and Wyer (2002) illustrates well the role a group membership plays in decision-making and that cultural identity could be regarded as a group membership in itself, although at the macro level. An interesting implication is that when individuals are primed on their cultural identity, they adopt a group mind-set displaying

concerns for equality and a tendency to compromise similar in nature to membership in any ad hoc groups. This finding holds true for both individualist and collectivist cultures. Comparable findings in terms of peer approval are found in Tse et al. (1988), where Chinese executives were found to be more concerned with saving face than Canadian executives. Additionally, Chinese executives were more inclined to joint-ventures, and maintaining long-term relationships.

The observed differences in self-regulatory goals between collectivist and individualist cultures are frequently attributed to the salient interdependent self in collectivist cultures, whereas individualist cultures are commonly considered to foster the independent self (Aaker 2006; Aaker and Lee 2001; Lee and Aaker 2004; Lee, Aaker, and Gardner 2000; Singelis 1994).[12] It is believed that these two self-views have differing goals; the interdependent self is inclined toward the affiliation with others and the carrying through of the corresponding duties to peers. The independent self instead seeks to achieve self-sufficiency, the climbing of the social ladder, and the attaining personal relative success (Aaker and Lee 2001; Heine et al. 1999). In the persuasion domain, framing the product offering in the promotion versus prevention domains have been shown to increase individuals' motivation to process information, and hence their elaboration likelihood, when these domains correspond to the goals of individuals' salient self-views (Lee, Aaker, and Gardner 2000). The effect of this regulatory fit also extends to attitude formation; when the framing of product offerings correspond to the current

[12] Regulatory focus theory proposes that individuals with a promotion focus will seek to regulate their behaviour in the direction of positive outcome, but individuals with a prevention focus will regulate their behaviour away from negative outcomes. For reviews on regulatory focus theory, including regulatory goals and regulatory fit—the match between regulatory focus and choice of activities and products—see Aaker and Lee (2006), Avnet and Higgins (2006), Brockner et al. (2002), Higgins (2002), Higgins (2000), Higgins (1997), and Herzenstein, Posavac, and Brakus (2007).

self-view, individuals hold more favourable attitudes toward brands and advertisements (Aaker and Lee 2001; Lee and Aaker 2004).

In the dual process models of persuasion, and more specifically within the HSM, heuristic processing is contrasted to systematic processing where the views of others, as featured in online consumer reviews or advertisements, could be regarded as one type of heuristic cue. Past research on information processing has showed that consumers in individualistic cultures tend to let consensus information influence evaluations only under low motivation. On the other hand, under high motivation, attribute information is more likely to influence the evaluation. Interestingly, when the two modes of processing yield contradictory information, consumers in individualistic cultures rely more on the processing of attribute information and less so on the processing of consensus information (Axsom, Yates, and Chaiken 1987; Mackie 1987; Maheswaran and Chaiken 1991; Slovic 1966).

Aaker and Maheswaran (1997) tested whether the findings from individualistic cultures regarding information processing generalizes to collectivist cultures. In doing so, they showed that some similarities exist; both types of cultures tend to use both the consensus cue and the attribute information when motivation is high and when the two sources of information agrees on the merits of the offering. However, when motivation is high but the provided information is incongruous, the two cultures differ; only consensus information is utilized for assessments in collectivist cultures, whereas the attribute information has greater weight in individualist cultures. In other words, individualist and collectivist cultures seem to display a reversed use of the HSM. The question at hand is then whether or not this information strategy reversal is due to cross-cultural differences in perceived cue-diagnosticity; Aaker and Maheswaran (1997) investigated the said issue

by providing a heuristic cue hypothesized to remain constant across cultures. The results indicate that the differences can be attributed to cross-cultural differences in perceived cue-diagnosticity.

In two related studies Briley, Morris, and Simonson (2000) and Briley and Aaker (2006) sought to determine under which situations culturally rooted norms and judgments override personal knowledge and vice versa. The first study found that when individuals in both collectivist and individualist cultures were asked to provide reasons prior to making product choices, culturally stable differences in preferences for compromise products were found. That is, American individuals were found to have a significantly lower inclination for compromise alternatives when they were asked to give reasons, whereas Chinese and Japanese increased their tendency to choose compromise alternatives. Briley and Aaker (2006) looked at differences in persuasion effects across the individualist-collectivist cultural dichotomy. Culturally rooted judgments were found to be prevalent in situations where individuals were likely to process information in a reflexive way; for instance, in situations when they have to make quick judgments. In those situations Chinese individuals had more favourable attitudes toward advertisements framed as preventing a negative outcome, whereas American individuals were more persuaded by advertisements emphasizing the gain that could be achieved from using the product. However, when Chinese and American participants were encouraged to participate in deliberation of the message, or were not pressured by time constraints, there was no difference in attitudes.

All in all, these findings support the view that cultural norms do not wield a steady effect on individuals across situations.

4.3 Hypotheses

When consumers in individualist cultures are primed on their cultural identity, they adopt a group mind-set (Briley and Wyer 2002). This group mind-set causes them to adopt a prevention focus; consequently, consumers become more concerned with the negative aspects of decisions rather than the positive consequences (Aaker and Lee 2001; Briley and Wyer 2002). In addition, preferences for equality and tendencies to compromise become stronger, which are concerns typically found in collectivist cultures.

Since priming individualist members on their cultural identity induces a group mind-set resulting in an equalization of their preferences to those observed in collectivist cultures, it does not seem farfetched to expect that it would have an analogous impact on individuals' information processing strategies. Particularly, within the HSM, if the heuristic cue consists of consensus information of others and if consumers regard these 'others' as their reference group, then it seems likely that the salient cultural group mind-set would cause consumers to pay more attention to the consensus cue in attitude formation.

Aaker and Maheswaran (1997) identified that under incongruity and high motivation, members of collectivist cultures use only consensus information for evaluations, whereas members of individualist cultures are more inclined to rely on attribute information.[13] More specifically, the findings suggest that attenuation of the attribute information occurs under conditions of high and low motivation and incongruity. Secondly, additivity occurs under high motivation and congruity. Briley

[13] Aaker and Maheswaran (1997) did not specifically investigate the information processing strategies for members of individualist cultures in this particular article, but rather contrasted their results to earlier findings presented in Maheswaran and Chaiken (1991), Axsom, Yates and Chaiken (1987), Mackie (1987), and Slovic (1966).

and Wyer (2002), in turn, concluded that priming individuals on their cultural identity induces a group mind-set which extrapolates to both individual and group-decision situations. The group mind-set results in preferences toward equality and compromises, as well as minimizing the risk for negative outcomes. This orientation holds for both ad hoc groups and the cultural group membership. Table 4-3 summarizes the most important findings regarding individuals' information processing strategies in collectivist cultures, as presented in Aaker and Maheswaran (1997), and the effect of cultural salience on outcome preferences as evidenced in Briley and Wyer (2002). Figure 4-2 presents a simple pictorial outline of HSM and the core findings regarding information processing in collectivist versus individualist cultures as found in Aaker and Maheswaran (1997).

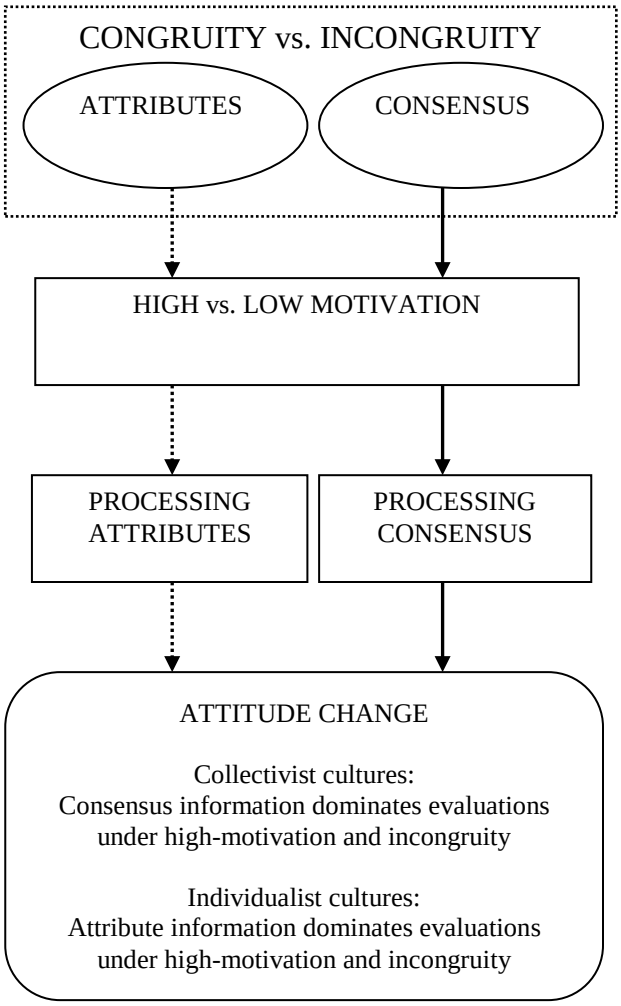
Table 4-3

Central findings of Aaker & Maheswaran (1997) and Briley & Wyer (2002)

Aaker & Maheswaran (1997)		Briley & Wyer (2002)	
Collectivist cultures:		Individualist & Collectivist cultures:	
1.	Consensus influences evaluations regardless of motivation and congruity	1.	Cultural salience induces a feeling of group membership similar to that from actual participation in groups.
2.	Attribute information influences evaluations only under high-motivation and congruity.	2.	Group mind-set results in preferences for compromise, equality, and choosing products to avoid negative outcomes.
3.	The number of consensus thoughts is equal across all conditions.	3.	The feeling of group membership can influence decisions that are irrelevant to this group.
4.	The number of attribute thoughts is greater under congruity vs. incongruity. Under low motivation, the number of attribute thoughts is equal regardless of congruity.		
5.	Consensus-thought valence influences evaluations under all conditions		
6.	Attribute-thought valence influences evaluations only under high motivation, and congruity.		

Figure 4-2

Information processing under high motivation and incongruity in collectivist vs. individualist cultural orientation



Hence, to summarize, in individualist cultures the (1) consensus information (heuristic cue) typically influences evaluation only under low motivation, (2) under high motivation the influence of consensus information essentially mitigates, (3) under incongruity and high motivation, heuristic processing will typically be attenuated by systematic processing (Axsom, Yates, and Chaiken 1987; Mackie 1987). When imposing

a group mind-set by priming individuals on their cultural identity, their interdependent self will become salient; the result is that others' opinions are regarded as more important, resulting in less attention to internal feelings (Aaker and Maheswaran 1997; Markus and Kitayama 1991).

Individuals' cognitive responses can be classified as being either consensus-related or attribute-related. Therefore, whenever attribute information forms the basis for evaluations, one would expect more attribute-related thoughts. When calling subjects on their cultural identity their interdependent self becomes salient, and as noted above, one would expect that subjects would be more likely to elaborate on the consensus information across all levels of motivation and congruity. On the other hand, when subjects are primed on their cultural identity they will be less likely to elaborate on the attribute information; this will happen primarily under high motivation and congruity.

Whenever individuals use heuristic processing, not only would one expect that they elaborate on the consensus information, but also that consensus-thought valence would influence the evaluations. Similarly, if individuals employ systematic processing, subjects will elaborate on the attribute information and attribute-thought valence would influence the evaluations. When priming individuals on their cultural identity their interdependent self will become salient, resulting in that they will become more similar to members of collectivist cultures. Individuals from collectivistic cultures have been found to let consensus-thought valence influence evaluations under all levels of motivation and congruence. However, elaboration of attribute information will only take place under high motivation and congruity. Hence, when priming individuals on their cultural identity one may form the following hypotheses:

H1: Priming members of individualist cultures on their cultural identity will result in the generation of more consensus-related thoughts and fewer attribute-related thoughts across levels of motivation and congruity.

H2: Priming members of individualist cultures on their cultural identity will decrease the impact of attribute-thought valence and increase the impact of consensus-thought valence across levels of motivation and congruity.

4.4 Experimental procedures

All sessions of the study ran at the University of Alberta as a computer mediated experiment with participants recruited from the University of Alberta volunteer research participation pool. Each individual was paid $10 for their participation and the study took between 30 and 45 minutes to complete. All participants came to one room initially where they were seated in separate booths facing a computer screen, facing away from each other. Each session started with some general instructions provided by the experimenter and all participants began the study at the same time. All the necessary task instructions were provided on the computer screens and when performing the first task, participants had no information regarding the exact nature of the subsequent tasks. In each session all respondents participated in two tasks.[14]

In the first section, participants were told that the purpose of the task was to assess people's general knowledge with regards to their ability to identify important objects or events and the time period with which they are primarily associated. The

[14] The full experimental script is available in Appendix B.

second task was labelled as 'Attitudes and preferences toward products' and involved responses on attitudes toward a new digital camcorder, in addition to choosing four products described with two attributes varying in magnitude in four choice set scenarios. Finally, participants completed a set of manipulation checks, a free recall task, an open-ended suspicion probe, a scale measuring the horizontal and vertical dimensions of individualism and collectivism (Sivadas, Bruvold, and Nelson 2008), and a descriptive personal survey. Participants were then debriefed.

The experimental design was 2(Canadian culture is salient: high vs. low) × 2(Motivation: high vs. low) × 2(Congruence: high vs. low) and participants were randomly allocated to the treatment cells.

4.4.1 Manipulation of cultural salience

To make participants' cultural identity salient, the same procedure used successfully by Briley and Wyer (2002) and Hong et al. (2000) was employed. Specifically, all participants were told that the reason for this task was to assess participants' general knowledge regarding their ability to identify important objects or events and the time period with which they were primarily associated. On this pretense, all participants were shown six pictures. In the Canadian cultural salience high-condition, participants were shown a series of six pictures portraying Canadian cultural icons. The pictures portrayed: (1) the Canadian flag, (2) Wayne Gretzky playing for the Canadian National Hockey Team, (3) Celine Dion, (4) Terry Fox running the Marathon of Hope, (5) a Royal Canadian Mounted Police, and (6) a Canadian Quarter promoting the 2010 Vancouver Olympic Games. The Canadian culture low condition, instead presented six pictures showing six Chinese cultural icon motives: (1) a Chinese Dragon, (2) The Great Wall of

China, (3) a girl playing a traditional Chinese instrument, (4) the Terracotta Army, (5) a Chinese opera singer, and (6) a character from the famous Chinese novel 'A Journey to the West'. All participants were asked write a paragraph with regards to their beliefs as to the motifs of the pictures, and the approximate time period in which the motif existed or was created.

4.4.2 Manipulation of high versus low motivation

In the same fashion as in Aaker and Maheswaran (1997), motivation was manipulated by letting the participants know the study was part of an important market survey conducted on behalf of a large-scale electronics manufacturer, planning to introduce a new camcorder and therefore in need of participants' opinions as consumers. In addition, for the high motivation condition, participants were told that they were part of a small and selected group of individuals in Western Canada whose opinions were being sought by the manufacturer. Finally, the participants were instructed that their opinions were highly relevant and would weigh heavily in the decisions to introduce the new camcorder and that the product was planned to be marketed in Western Canada. For the low level of motivation, the amount of words was fairly equal and the introductory phrase regarding the need for a large-scale electronics manufacturer to obtain consumer opinions about the new product was about the same. However, in this condition participants were instead instructed that they were part of a large opinion survey conducted across many universities and cities in Canada. In addition, they were told that their individual opinions were not important as they would be averaged across all respondents participating in the survey. Lastly, participants in the low motivation condition were told that the new product was planned to be marketed in Eastern Canada. Finally, participants

in both the high and low motivation condition were informed that they would be provided with two sets of information regarding the new camcorder and that they study would continue on the subsequent screen.

4.4.3 Manipulation of high versus low congruency

All participants were given two sets of information regarding the digital camcorder 'VXC-660'. One piece of information was comprised by ostensibly positive or negative test-market results (consensus cue) suggesting a favourable or unfavourable assessment of the product by 300 consumers in Western Canada. The other piece of information consisted of positive or negative attribute information, ostensibly provided by an independent product testing agency that had assessed the VXC-660 and compared it to two leading competitive brands on six attributes. To maintain consistency and comparison across studies, the wording was similar to Aaker and Maheswaran (1997) and Maheswaran and Chaiken (1991).

In the positive consensus cue condition, participants were informed that of the 300 consumers in Western Canada who had used it, 81% were extremely satisfied with the VXC-660 and less than 3% were extremely dissatisfied. For the negative consensus cue condition the wording was instead that just under 20% were extremely satisfied with the VXC-660 and just under 50% were extremely dissatisfied with the digital camcorder. Next, participants were provided with the product information (systematic information) from the independent testing agency. The six attributes of the digital camcorder were the same as in (Aaker and Maheswaran 1997); (1) picture quality, (2) sound quality, (3) automatic features, (4) colour accuracy, (5) remote control, and finally (6) ease of operation. The positive attribute information described the VXC-660 as being superior to

the two leading competitors on five of the six attributes (i.e. picture quality, sound quality, automatic features, colour accuracy, remote control) but equally good with regards to ease of operation. In the negative attribute information treatment, the VXC-660 was instead described as being inferior to the two leading competitors on five of the six attributes (i.e. picture quality, sound quality, automatic features, colour accuracy, remote control), whereas it was deemed on par with the two competitors regarding ease of operation.

The consensus cue and the attribute information were orthogonally manipulated in order to achieve two level of congruity. Accordingly, for the positive congruent condition, participants were first shown the positive consensus cue and the positive attribute information. For the negative congruent condition, the negative consensus cue preceded the negative attribute information. In the low congruity condition, participants were either presented with positive consensus cue and then the negative attribute information, or the negative consensus cue, followed by the positive attribute information. Table 4-4 summarises the four high versus low congruity treatments; (I) Positive congruity, (II) Positive incongruity, (III) Negative congruity, (IV) Negative incongruity, including the order in which the consensus cue and attribute information were presented to the participants.

Table 4-4

Summary of the manipulations of congruity

Congruity: high		Congruity: low	
I:	Positive congruity:	II:	Positive incongruity
1.	Positive consensus cue	1.	Positive consensus cue
2.	Positive attribute information	2.	Negative attribute information
III:	Negative congruity:	IV:	Negative incongruity
1.	Negative consensus cue	1.	Negative consensus cue
2.	Negative attribute information	2.	Positive attribute information

4.4.4 Elicitation of participants' responses

After the participants had been shown the consensus cue and the attribute information for the VXC-660, they were asked a series of questions regarding their thoughts and evaluations regarding the new product. Specifically, on a nine-point scale from -4 to 4 they were asked to indicate as to the extent they agreed or disagreed on statements inquiring about their intentions to purchase the VXC-660 camcorder, their extent of favourability toward the product, and if they regarded it as useful and a good product. To maintain comparability across studies, the wording was similar to the one used in Aaker and Maheswaran (1997). When participants had finished this section they were taken to the next screen where they were given three minutes to list any thoughts that occurred to them about the VXC-660 while reading the product description.

Five sets of manipulation checks were distributed to the participants as part of the study. First off, participants rated the extent to which they felt motivated to read the

product information regarding the VXC-660 on two seven-point scales: not interested versus highly interested and not involved versus highly involved. Secondly, participants rated the extent to which they felt the attribute information depicted the VXC-660 as having many positive versus negative attributes. In addition, the participants were asked about the extent they felt the product description portrayed it as being superior to the competing brands. Thirdly, they indicated to what extent they regarded the consensus cue as providing a favourable versus unfavourable opinion as to the merits of the VXC-660 in addition to recalling the percentage of consumers who were extremely satisfied with the VXC-660 camcorder. Fourthly, participants were asked to what extent they deemed the consensus cue and attribute information incompatible versus compatible and dissimilar versus similar.

In the last manipulation check, participants were presented with four product choices, where each choice set contained three products differing on two attribute dimensions. Within each choice set, two choice options had a high value along one attribute dimension and a low value along the other attribute dimension and one choice option had mid-range values on both attribute dimensions, which constituted the compromise option.[15] Briley, Morris, and Simonson (2000) found that Asian individuals were more inclined to choose the compromise alternative, whereas North-American individuals had a preference for the extreme option. Also, Briley and Wyer (2002) found that participants exposed to icons of their own culture tended more toward compromise

[15] Simonson and Tversky (1992) discussed and identified the impact of trade-off contrast and extremeness aversion on choice probabilities in situations where consumers do not have well-established preferences. In particular, the extremeness aversion could be explained by the fact that product disadvantages incur greater disutility than the incremental utility gained from product advantages. The trade-off contrast, in turn, involves the effect on subsequent choices due to the Background; the pairs of options and trade-offs experienced in the past.

options, but were less inclined to give self-referent explanations as a justification of their choice.

Participants were explicitly told that all products were similar on all other dimensions except the two on which the products were described. They were also instructed to write a paragraph giving a reason for selecting one option over the others prior to indicating their choice. Four product classes were featured: (1) digital SLR cameras differing on reliability rating and maximum autofocus range, (2) laptop computers differing on hard disk capacity and maximum battery life, (3) television sets differing on screen size and resolution, and finally (4) laser printers differing on print speed and tray capacity. Table 4-5 presents the shopping scenario for laser printers.

Table 4-5

Example of shopping scenario presented to participants

Laser printers	Print speed (pages per minute)	Tray capacity (sheets)
Typical range	10-26	100-300
Option A	13	280
Option B	18	200
Option C	23	120

All participants completed a 14-item scale measuring the horizontal and vertical dimensions of individualist-collectivist dichotomy suggested by Sivadas, Bruvold, and Nelson (2008). These additional concepts concern preferences for equality versus hierarchy within cultures.

4.5 Experimental results

In total 93 individuals participated in this study, each one receiving a show-up payment of $10. Of the 93 individuals starting the study, four individuals did not complete the full study; hence, the total number of individuals that completed the study was $N = 89$. As there are two ways of achieving high (both attribute and consensus information being positive or negative) versus low congruence (either consensus information being positive and attribute information being negative or consensus information being negative and attribute information being positive) the total number of experimental groups was 16. Table 4-6 shows the allocation of the 89 participants that completed the study across the eight experimental basic treatments and 16 experimental groups.

Table 4-6

Number of participants across experimental conditions

Treatment	Group	Cultural Salience	Congruence	Motivation	Consensus	Attribute	Completed
1	1	Low	Low	Low	-	+	4
1	2	Low	Low	Low	+	-	5
2	3	Low	Low	High	-	+	6
2	4	Low	Low	High	+	-	5
3	5	Low	High	Low	-	-	5
3	6	Low	High	Low	+	+	5
4	7	Low	High	High	-	-	5
4	8	Low	High	High	+	+	7
5	9	High	Low	Low	-	+	7
5	10	High	Low	Low	+	-	7
6	11	High	Low	High	-	+	6
6	12	High	Low	High	+	-	6
7	13	High	High	Low	-	-	5
7	14	High	High	Low	+	+	6
8	15	High	High	High	-	-	6
8	16	High	High	High	+	+	4

As in Aaker and Maheswaran (1997) participants indicated their motivation to read the persuasive message regarding the VXC-660 Camcorder on two items: not versus highly interested and not versus highly involved and these responses were subsequently averaged to form a motivation index. Given the results obtained in Aaker and Maheswaran (1997) it could be expected that under high motivation, the motivation index would yield a significantly higher mean than under low motivation. Secondly, participants indicated to what extent they felt that the attribute information presented the VXC-660 as having many versus few positive features, few versus many negative

features, and finally whether they thought the VXC-660 was superior versus inferior to the competing brands. These responses were averaged to form an attribute index. As in Aaker and Maheswaran (1997) the expectation was that the positive attribute information would result in a significantly higher mean of the attribute index than the negative attribute information. Thirdly, the participants rated the extent to which they perceived the test market results for the VXC-660 were favourable or unfavourable and they also indicated their recall of the percentage of customers in the test market group who were extremely satisfied with the VXC-660. Fourthly, participants indicated the extent that they felt the test-market results and the product description were incompatible versus compatible and dissimilar versus similar and these two items formed a congruence index. Finally, as in Briley and Wyer (2002) participants were exposed to four shopping scenarios involving a choice between three products. For each product choice participants first provided a written explanation as to why the chosen option was preferred over the other two options. Following the results in Briley and Wyer (2002) it could be expected that participants for which Canadian cultural salience was high would be less likely to provide self-referent explanations than participants in the Canadian cultural salience low treatment.

In order to corroborate the effects of the experimental manipulations in Aaker and Maheswaran (1997) and Briley and Wyer (2002) five dummy-variable regressions were run. The results from these regressions are presented in Table 4-7. Examining first the motivation manipulation, the posterior distribution for the high motivation individuals extends marginally into the negative domain but is essentially positive, suggesting that the high motivation group felt more motivated to read the persuasive message concerning the VXC-660. The posterior mean, however, indicates a limited difference in comparison

to participants receiving the low motivation treatment. Comparing the participants that were exposed to the positive attribute information with those that were exposed to the negative attribute information the former group clearly perceived the VXC-660 as being superior; the credible interval is well above zero. Participants also correctly perceived the positive consensus information as being more favourable than the negative consensus information; the credible interval is entirely positive although the posterior mean suggests a limited difference in comparison to the base group.[16] The congruence manipulation also worked as expected; participants correctly detected that the attribute information and the test market result pertaining to the VXC-660 provided a more compatible view under the congruent condition than under the incongruent condition. As shown in Table 4-7, the credible interval is located well away from zero in the positive domain.

Finally, the manipulation of cultural salience is more challenging to test, but the findings of Briley and Wyer (2002) suggest that participants might be more inclined to think of themselves as group members when they have been primed on their cultural identity than when they have not. As a consequence, it could be expected that participants could be more tended toward choosing product options that constitute a compromise among levels of different attributes rather than product options with extreme levels on one or several of the product attributes (Briley and Wyer 2002). In addition, individuals might be less inclined to provide self-referent explanations as to their product choices in the four shopping scenarios; for instance, 'This laser printer is the best one for

[16] In addition, the majority of participants in most experimental conditions could correctly recall the percentage of consumers in the test market result favouring the VXC-660 ($\bar{X} = 65$). However, the result is still considerably lower than what was obtained in Aaker and Maheswaran (1997); $\bar{X} = 84$.

me as it can print faster', as opposed to 'Because it has an average print speed and an average tray capacity' (Briley and Wyer 2002).

To assess the extent of compromise choices a S_B-Binomial model was estimated where the probability of choosing a compromise option varied by respondent, p_i.[17] This model assumes a Binominal distribution for the response data, but entails the estimation of a prior distribution for $\text{logit}(p_i)$. As seen, the credible interval suggests that participants in the cultural salience high condition had a weakly greater tendency to make compromise options than participants in the cultural salience low condition; the posterior distribution is essentially positive, but extends marginally into the negative domain. In a similar fashion, the number of product choice explanations involving a self-referent component was computed for each of the 89 participants. Another S_B-Binomial model was fitted to this data with a dummy variable representing the cultural salience high condition. As shown in Table 4-7, the posterior mean for participants exposed to the cultural salience high condition is negative, suggesting a lessened tendency to provide self-referent explanations as reason to pick one option over the others in the four shopping scenarios. The corresponding credible interval also suggests mainly a negative impact on the extent of self-reference explanations when culture is salient even though the credible interval extends into the positive domain.

All in all, the reported findings suggest that the experimental manipulations had the expected effect on the participants' inclinations. These results hence confirm the

[17] This approach draws on Johnson (1949) who developed a system of three classes of transformations to achieve normality. In particular, of the three classes in the Johnson systems the S_B denomination refers to a Logistic transformation; hence, a transformation of a true bounded (B) distribution to gain an unbounded (normal) distribution. A recent review of the Johnson system and a coverage of some of the empirical issues encountered when fitting data to the same is provided in Chen and Kamburowska (2001). Câmara and Chung (2006) provide an example of the S_B-Binomial model in option pricing. Finally, see Congdon (2007) for a discussion of this model in the Bayesian domain.

findings of Aaker and Maheswaran (1997) and Briley and Wyer (2002). A caveat when drawing these conclusions, however, is the somewhat weak effect found for the motivation and cultural salience manipulations.

Table 4-7

Regressions on experimental manipulations

Variable	Posterior mean	Credible interval 2.5%, Median, 97.5%
Motivation		
Intercept	3.59	3.10, 3.59, 4.09
High	0.55	-0.14, 0.55, 1.25
Low	0	
Attribute		
Intercept	2.11	1.75, 2.11, 2.46
Positive	2.93	2.43, 2.93, 3.43
Negative	0	
Consensus		
Intercept	3.25	2.64, 3.25, 3.86
Positive	0.86	0.01, 0.86, 1.71
Negative	0	
Congruence		
Intercept	2.89	2.44, 2.89, 3.35
High	1.36	0.71, 1.36, 2.01
Low	0	
Cultural salience: Compromises		
Intercept	-0.49	-0.81, -0.49, -0.17
High	0.36	-0.07, 0.36, 0.80
Low	0	
Cultural salience: Self-reference		
Intercept	0.486	-0.04, 0.48, 1.04
High	-0.60	-1.36, -0.59, 0.13
Low	0	

As in Aaker and Maheswaran (1997) participants were asked to list any thoughts that occurred to them about the VXC-660 camcorder while reading the product description.

This information was subsequently coded as consensus related (C) or attribute related (A). In addition, participants' thoughts were coded according to if they expressed a positive (+), negative (-) or neutral (0) view toward the VXC-660. Any occurrence of thoughts expressing a discrepancy between the consensus information and the attribute information was coded as (D) and thoughts that had no reference to the VXC-660 were classified as irrelevant (I).

According to the hypotheses, it could be expected that participants who were exposed to the cultural salience high condition would generate a greater number of consensus-related thoughts concerning the VXC-660. This would hold regardless of motivation and congruity. Analogously, regardless of the level of motivation and congruity one could expect that the number of attribute-related thoughts would decrease in the cultural salience high condition. To test this, a Poisson regression was estimated with dummy variables representing the cultural salience high condition and whether participants were born and/or raised in Canada. These two dummy variables were also interacted. An examination of the raw data revealed that the majority of participants did not list any consensus related thoughts and several of the participants did not list any attribute-related thoughts. To account for the zero-inflated distribution a mixed Poisson representation was used.[18] Hence, participants' distribution of consensus- and attribute-related thoughts was specified as: $Y \sim Poisson(\lambda(1-U))$ and $U \sim Bernoulli(\pi_0)$. The canonical link function $\log(\lambda)$ was used to specify the relationship between the predictor variables and the mean of the Poisson distribution.

[18] For a discussion on the zero-inflated Poisson regression see Lambert (1992); Ridout, Hinde, and Demetrio (2001); and Ghosh, Mukhopadhyay, and Lu (2006). A detailed discussion on how to implement zero-inflated models in WinBUGS is provided in Ntzoufras (2009).

Table 4.8 presents the estimation results for the two regressions. As seen, neither the regression for attribute-related thoughts nor the regression for consensus-related thoughts has a significant main effect for participants who were born and/or raised in Canada; in both cases the median of the credible interval is close to zero. Moreover, the cultural salience high condition has a small and insignificant impact on the tendency for having consensus- and attribute-related thoughts; in both cases the median of the credible interval is in the neighbourhood of zero. Looking at the interaction between the cultural salience high condition and participants that were born and/or raised in Canada, however, there is an indication of an impact on the number of thoughts in both regression analyses. In the consensus thought regression, the credible interval is basically positive suggesting that Canadians that were exposed to the cultural salience high condition were more likely to have consensus-related thoughts. In addition, the attribute thought regression indicates a decreased tendency for Canadians in the cultural salience high condition to have attribute-related thoughts and this holds regardless of the level of motivation and congruity.

To conclude, altogether these findings suggest that there is a tendency to switch from systematic processing toward heuristic processing, according to the HSM denomination, when members of individualist cultures are primed on their cultural identity. This finding holds regardless of the level of motivation and congruity.[19]

[19] Two regressions were also estimated to investigate the relationship between consensus-thought valence and the valence of the consensus cue and attribute-thought valence and the valence of the attribute information. The results indicate that more favourable consensus-related thoughts were elicited across the experimental conditions when consensus was positive. Moreover, the attribute-related thoughts were more favourable when the attribute information was positive.

Table 4-8

Zero-inflated Poisson regression of consensus and attribute thoughts

Variable	Posterior mean	Credible interval 2.5%, Median, 97.5%
Consensus thoughts		
Intercept	-1.43	-2.41, -1.42, -.49
Born/Raised		
Canada	-.37	-2.35, -.31, 1.26
Not	0	
Cultural salience		
High	-.78	-2.38, -.75, .63
Low	0	
Interaction	1.50	-.72, 1.45, 3.99
Attribute thoughts		
Intercept	.51	0.22, 0.52, 0.79
Born/Raised		
Canada	-.02	-.57, -.01, .50
Not	0	
Cultural salience		
High	.20	-.19, .19, .59
Low	0	
Interaction	-.59	-1.35, -.59, .16

The cognitive root of attitudes toward the VXC-660 was investigated by regressing the evaluation index on attribute-thought valence and consensus-thought valence while controlling for idiosyncratic differences in horizontal and vertical individualism/collectivism. As seen in Table 4-9, both consensus-thought valence and attribute-thought valence influenced attitudes toward the VXC-660 across all conditions; both credible intervals are entirely positive. In addition, both the horizontal collectivism and vertical individualism scale had significant explanatory power for participants' evaluation of the digital camcorder. When priming individuals on their cultural identity,

the impact of attribute-thought valence on product attitudes should decrease but the impact of the consensus-thought valence on attitudes should increase. This was tested by re-estimating the regression with an added dummy variable indicating the cultural salience high condition.[20] As presented in Table 4-9, the results confirm the main effect of attribute- and consensus-thought valence. Looking at the interaction between cultural salience and attribute-thought valence, there is some indication of a lessened impact of the attribute-thought valence. This finding suggests that across all experimental conditions, the impact of attribute-thought valence on attitudes decreased in the cultural salience high condition. The corresponding interaction between consensus-thought valence and cultural salience, however, is almost perfectly balanced around zero suggesting that the effect of consensus-thought valence is constant regardless of the level of cultural salience.

[20] In this regression analysis the four domains of idiosyncratic cultural orientation was excluded as the cultural salience treatment could directly have impacted participants' subsequent responses to this scale.

Table 4-9

Regression of evaluation index against consensus- and attribute-thought valence

Variable	Posterior mean	Credible interval 2.5%, Median, 97.5%
Evaluation index		
Intercept	-1.16	-4.04, -1.16, 1.71
Attribute-thought valence	.71	.47, .71, .96
Consensus-thought valence	1.29	.27, 1.29, 2.30
Horizontal collectivism (HC)	-.49	-.89, -.49, -.09
Vertical collectivism (VC)	.28	-.12, .28, .68
Horizontal individualism (HI)	.03	-.30, .03, .36
Vertical individualism (VI)	0.34	.08, .34, .59
Evaluation index		
Intercept	-.30	-.73, -.30, .13
Attribute-thought valence	.84	.47, .84, 1.21
Consensus-thought valence	1.41	-.002, 1.41, 2.83
Interaction	-.12	-.63, -.12, .39
Attribute-thought valence and cultural salience		
Interaction	.16	-1.91, .16, 2.22
Consensus-thought valence and cultural salience		

4.6 Summary and discussion

Past research has demonstrated a difference in the use of information processing strategies between members of individualist and collectivist cultures. In particular, when the two pieces of information are attribute and consensus information, individualist members tend to employ the attribute information when forming attitudes whereas collectivist members utilize the consensus information. When individualist members are primed on their cultural identity, however, they have been found to exhibit similar concerns regarding compromise choice options as collectivist members.

This chapter integrated and built upon these findings by investigation how individuals' information processing strategies changed when they were primed on their cultural identity. Testing of the experimental manipulations to some extent confirmed the findings of past research; individuals in the high motivation condition were more motivated to read the persuasive message regarding the VXC-660 camcorder and also accurately detected when the attribute information and consensus cue were incongruent. Moreover, two regression analyses established that more favourable attribute-related thoughts were elicited when attribute information was positive and more favourable consensus-related thoughts were elicited when consensus information was positive. Estimation of a hierarchical S_B-Binomial model on the number of compromise choices made in four shopping scenarios indicated that participants in the cultural salience high condition made a greater number of compromise product choices. Also, in a second S_B-Binomial model, participants in the cultural salience high condition were found to provide fewer self-referent explanations with regards to their product choices in the four shopping scenarios.

The number of attribute-related thoughts was hypothesized to decrease for Canadians in the cultural salience high condition. Likewise the number of consensus-related thoughts was hypothesized to increase. As many participants did not list any consensus-related thoughts these two hypotheses was tested by estimating a zero-inflated Poisson regression where the distribution of participants' responses was specified as a mixture of a Poisson distribution and a Bernoulli distribution. Canadians in the cultural salience high condition listed fewer attribute-related thoughts and more consensus-related thoughts across the experimental cells. Given the definition of heuristic versus systematic information processing in the HSM the results provide a clear indication of a

switch in information processing strategy from attribute-related information in favour of consensus-related information.

Participants' evaluations of the VXC-660 were clearly influenced by both attribute-thought valence and consensus-thought valence across all experimental conditions. However, the impact of cultural salience on the number of consensus- versus attribute-related thoughts did not fully translate into an analogous impact on attitudes toward the VXC-660. In particular, the interaction with consensus-thought valence was insignificant across conditions. There was an indication, however, of a lessened effect of attribute-thought valence on attitudes under the cultural salience high condition.

Finally, a substantial problem with undertaking studies of this kind where culture and cultural identity is at focus is to obtain a 'clean' sample; of the 89 participants a minority indicated that they were born and/or raised in Canada. With regards to product evaluations, it is quite likely that a stronger effect would have been obtained for attribute-thought valence under the cultural salience high condition if one could have attracted more Canadian participants. Likewise, it is probable that the interaction between cultural salience and consensus-thought valence would have been significant if more Canadians had participated in this study.

4.7 References

Aaker, Jennifer L. (2000), "Accessibility or diagnosticity? Disentangling the influence of culture on persuasion processes and attitudes," Journal of Consumer Research, 26 (4), 340-57.

---- (2006), "Delineating culture," Journal of Consumer Psychology, 16 (4), 343-47.

Aaker, Jennifer L. and Angela Y. Lee (2001), "'I' seek Pleasures and 'We' avoid pains: The role of self-regulatory goals in information processing and persuasion," Journal of Consumer Research, 28 (1), 33-49.

---- (2006), "Understanding regulatory fit," Journal of Marketing Research, 43 (1), 15-19.

Aaker, Jennifer L. and Durairaj Maheswaran (1997), "The effect of cultural orientation on persuasion," Journal of Consumer Research, 24 (3), 315-28.

Aaker, Jennifer L. and Jaideep Sengupta (2000), "Additivity versus attenuation: The role of culture in the resolution of information incongruity," Journal of Consumer Psychology, 9 (2), 67-82.

Al-Olayan, Fahad S. and Kiran Karande (2000), "A content analysis of magazine advertisements from the United States and the Arab world," Journal of Advertising, 29 (3), 69-82.

Alba, Joseph W. and Howard Marmorstein (1987), "The effects of frequency knowledge on consumer decision making," Journal of Consumer Research, 14 (1), 14-25.

Ashby, F. Gregory, Vivian V. Valentin, and U. Turken (2002), "The effects of positive affect and arousal on working memory and executive attention: Neurobiology and computational models," in Emotional Cognition: From Brain to Behaviour, S. Moore and M. Oaksford, Eds. Amsterdam: John Benjamins.

Avnet, Tamar and E. Tory Higgins (2006), "How regulatory fit affects value in consumer choices and opinions," Journal of Marketing Research, 43 (1), 1-10.

Axsom, Danny, Suzanne Yates, and Shelly Chaiken (1987), "Audience response as a heuristic cue in persuasion," Journal of Personality and Social Psychology, 53 (1), 30-40.

Bagozzi, Richard P. (1982), "A field investigation of causal relations among cognitions, affect, intentions, and behavior," Journal of Marketing Research, 19 (4), 562-83.

Batra, Rajeev and Michael L. Ray (1986), "Affective responses mediating acceptance of advertising," Journal of Consumer Research, 13 (2), 234-49.

Baumgartner, Hans, Mita Sujan, and James R. Bettman (1992), "Autobiographical memories, affect, and consumer information processing," Journal of Consumer Psychology, 1 (1), 53-82.

Biswas, Abhijit, Janeen E. Olsen, and Valerie Carlet (1992), "A comparison of print advertisements from the United States and France," Journal of Advertising, 21 (4), 73-81.

Bornstein, Robert F. (1989), "Exposure and affect: Overview and meta-analysis of research, 1968-1987," Psychological Bulletin, 106 (2), 265-89.

Briley, Donnel A. and Jennifer L. Aaker (2006), "When does culture matter? Effects of personal knowledge on the correction of culture-based judgments," Journal of Marketing Research, 43 (3), 395-408.

Briley, Donnel A., Michael W. Morris, and Itamar Simonson (2000), "Reasons as carriers of culture: Dynamic versus dispositional models of cultural influence on decision making," Journal of Consumer Research, 27 (2), 157-78.

Briley, Donnel A. and Robert S. Wyer, Jr. (2002), "The effect of group membership salience on the avoidance of negative outcomes: Implications for social and consumer decisions," Journal of Consumer Research, 29 (3), 400-15.

Briley, Donnel and Jennifer Aaker (2001), "When does culture matter? The transitory nature of cultural differences in judgments and choices," Advances in Consumer Research, 28 (1), 151-52.

Brock, Timothy C. (1967), "Communication discrepancy and intent to persuade as determinants of counterargument production," Journal of Experimental Social Psychology, 3 (3), 296-309.

Brockner, Joel, Srikanth Paruchuri, Lorraine Chen Idson, and E. Tory Higgins (2002), "Regulatory focus and the probability estimates of conjunctive and disjunctive events," Organizational Behavior and Human Decision Processes, 87 (1), 5–24.

Broniarczyk, Susan M., Wayne D. Hoyer, and Leigh McAlister (1998), "Consumers' perceptions of the assortment offered in a grocery category: The impact of item reduction," Journal of Marketing Research, 35 (2), 166-76.

Burshteyn, Dmitry and Cheryl L. Buff (2008), "Private-label brands, manufacturer brands, and the quest for stimulus generalization: An EEG analysis of frontal cortex response," Review of Business Research, 8 (6), 92-96.

Câmara, António and San-Lin Chung (2006), "Option pricing for the transformed-binomial class," Journal of Futures Markets, 26 (8), 759-87.

Chaiken, Shelly (1987), "The heuristic model of persuasion," in Social Influence: The Ontario Symposium Mark P. Zanna Zanna and James. M. Olson and Peter C. Herman, Eds. Vol. 5. Hilldale, NJ: Erlbaum.

---- (1980), "Heuristic versus systematic information processing and the use of source versus message cues in persuasion," Journal of Personality and Social Psychology, 39 (5), 752-66.

Chaiken, Shelly, Akiva Liberman, and Alice H. Eagly (1989), "Heuristic and systematic information processing within and beyond the persuasion context," in Unintended Thought, James S. Uleman and John A. Bargh, Eds. New York: Guilford Press.

Chaiken, Shelly and Durairaj Maheswaran (1994), "Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment," Journal of Personality and Social Psychology, 66 (3), 460-73.

Chaiken, Shelly, Wendy Wood, and Alice H. Eagly (1996), "Principles of persuasion," in Social Psychology: Handbook of Basic Principles, E. Tory Higgins and Arie W. Kruglanski, Eds. New York: The Guilford Press.

Chen, Hanfeng and Grazyna Kamburowska (2001), "Fitting data to the Johnson system " Journal of Statistical Computation and Simulation, 70 (1), 21-32.

Chen, Serena and Shelly Chaiken (1999), "The heuristic-systematic model in its broader context," in Dual-Process Theories in Social Psychology, Shelly Chaiken and Yaacov Trope, Eds. New York: The Guilford Press.

Chun, Woo Young, Scott Spiegel, and Arie W. Kruglanski (2002), "Assimilative behavior identification can also be resource dependent: The unimodel perspective on personal-attribution phases," Journal of Personality and Social Psychology, 83 (3), 542-55.

Clark, Terry (2003), "Culture's consequences: Comparing values, behaviors, institutions and organizations across nations, 2d ed," Journal of Marketing, 67 (2), 151-53.

Congdon, Peter (2007), Bayesian Statistical Modelling: Wiley.

de Mooij, Marieke and Geert Hofstede (2002), "Convergence and divergence in consumer behavior: Implications for international retailing," Journal of Retailing, 78 (1), 61-69.

Draguns, Juris G. (2007), "Culture's impact at the workplace and beyond," Reviews in Anthropology, 36 (1), 43-58.

Eagly, Alice H. and Shelly Chaiken (1993), "Process theories of attitude formation and change: The elaboration likelihood and heuristic-systematic models," in The Psychology of Attitudes. Fort Worth: Harcourt Brace Jovanovich College Publishers.

Erb, Hans-Peter, Arie W. Kruglanski, Woo Young Chun, Antonio Pierro, Lucia Mannetti, and Scott Spiegel (2003), "Searching for commonalities in human judgement: The parametric unimodel and its dual mode alternatives," European Review of Social Psychology, 14 (1), 1-47.

Fang, Xiang , Surendra Singh, and Rohini Ahluwalia (2007), "An examination of different explanations for the mere exposure effect," Journal of Consumer Research, 34 (1), 97-103.

Folkes, Valerie S. (1988), "Recent attribution research in consumer behavior: A review and new directions," Journal of Consumer Research, 14 (4), 548-65.

Foxall, Gordon R. (1994), "Behavior analysis and consumer psychology," Journal of Economic Psychology, 15 (1), 5-91.

Ghosh, Sujit K., Pabak Mukhopadhyay, and Jye-Chyi Lu (2006), "Bayesian analysis of zero-inflated regression models," Journal of Statistical Planning and Inference, 136 (4), 1360-75.

Gorn, Gerald J. (1982), "The effects of music in advertising on choice behavior: A classical conditioning approach," Journal of Marketing, 46 (1), 94-101.

Greenwald, Anthony G. (1968), "Cognitive learning, cognitive response to persuasion, and attitude change," in Psychological Foundations of Attitudes, Anthony G. Greenwald and Timothy C. Brock and Thomas M. Ostrom, Eds. New York Academic Press.

Hall, Edward T. (1976), The Dance of Life: The Other Dimension of Time. Garden City, NY: Anchor Press.

---- (1969), The Hidden Dimension: Man's Use of Space in Public and Private. London: Bodley Head.

---- (1959), The Silent Language. New York: Doubleday.

Heine, Steven J., Darrin R. Lehman, Hazel Rose Markus, and Shinobu Kitayama (1999), "Is there a universal need for positive self-regard?," Psychological Review, 106 (4), 766-94.

Herzenstein, Michal, Steven S. Posavac, and J. Joško Brakus (2007), "Adoption of new and really new products: The effects of self-regulation systems and risk salience," Journal of Marketing Research 44 (2), 251-60.

Higgins, E. Tory (1997), "Beyond pleasure and pain," American Psychologist, 52 (12), 1280-300.

---- (2002), "How self-regulation creates distinct values: The case of promotion and prevention decision making," Journal of Consumer Psychology, 12 (3), 177-91.

---- (2000), "Making a good decision: Value from fit," American Psychologist, 55 (11), 1217-30.

Hofstede, Geert (1980), Culture's Consequences: International Differences in Work-related Values. Beverly Hills: Sage Publications.

---- (1991), Cultures and Organizations: Software of the Mind. London: McGraw-Hill.

---- (1998), Masculinity and Feminity: The Taboo Dimensions of National Cultures. Thousand Oaks, California: Sage Publications.

Hong, Ying-yi, Michael W. Morris, Chi-yue Chiu, and Verónica Benet-Martínez (2000), "Multicultural minds: A dynamic constructivist approach to culture and cognition," American Psychologist, 55 (7), 709-20.

Hsee, Christopher K. and Elke U. Weber (1999), "Cross-national differences in risk preference and lay predictions," Journal of Behavioral Decision Making, 12 (2), 165-79.

Janiszewski, Chris and Luk Warlop (1993), "The influence of classical conditioning procedures on subsequent attention to the conditioned brand," Journal of Consumer Research, 20 (2), 171-89.

Johnson, Norman Lloyd (1949), "Systems of frequency curves generated by methods of translation," Biometrika, 36 (1), 149-76.

Kaufman, Carol Felker, Paul M. Lane, and Jay D. Lindquist (1991), "Exploring more than 24 hours a day: A preliminary investigation of polychronic time use," Journal of Consumer Research, 18 (3), 392-401.

Kruglanski, Arie W., A. Fishbach, Hans-Peter Erb, Antonio Pierro, and Lucia Mannetti (2003), "The unimodel as a theory of persuasion," in Theoretical Perspectives on Attitudes for the 21st Century: The Gregynog Symposium, Geoffrey Haddock and Gregory R. Maio, Eds. New York Psychology Press. .

Kruglanski, Arie W. and Erik P. Thompson (1999), "Persuasion by a single route: A view from the unimodel," Psychological Inquiry, 10 (2), 83-109.

Lambert, Diane (1992), "Zero-inflated Poisson regression, with an application to defects in manufacturing," Technometrics, 34 (1), 1-14.

Lau, Loraine and Jennifer Aaker (1998), "Culture and consumer behavior: The impact of cultural orientation on language trust and self-expression," Advances in Consumer Research, 25 (1), 12-12.

Lee, Angela Y. and Jennifer L. Aaker (2004), "Bringing the frame into focus: The influence of regulatory fit on processing fluency and persuasion," Journal of Personality and Social Psychology, 86 (2), 205-18.

Lee, Angela Y., Jennifer L. Aaker, and Wendi L. Gardner (2000), "The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus," Journal of Personality and Social Psychology, 78 (6), 1122-34.

Loewenstein, George (2007), "Defining affect," Social Science Information, 46 (3), 405-10.

Mackie, Diane M. (1987), "Systematic and nonsystematic processing of majority and minority persuasive communications," Journal of Personality and Social Psychology, 53 (1), 41-52.

Maheswaran, Durairaj and Shelly Chaiken (1991), "Promoting systematic processing in low-motivation settings: Effect of incongruent information on processing and judgment," Journal of Personality and Social Psychology, 61 (1), 13-25.

Markus, Hazel Rose and Shinobu Kitayama (1991), "Culture and the self: Implications for cognition, emotion, and motivation," Psychological Review, 98 (2), 224-53.

McCracken, Grant (1986), "Culture and consumption: A theoretical account of the structure and movement of the cultural meaning of consumer goods," Journal of Consumer Research, 13 (1), 71-84.

Moon, Chris J. and Peter Woolliams (2000), "Managing cross cultural business ethics," Journal of Business Ethics, 27 (1), 105-15.

Mullen, Brian, Michael J. Migdal, and Drew Rozell (2003), "Self-awareness, deindividuation, and social identity: unraveling theoretical paradoxes by filling empirical lacunae," Personality and Social Psychology Bulletin, 29 (9), 1071-81.

Nelson, Michelle R., Frédéric F. Brunel, Magne Supphellen, and Rajesh V. Manchanda (2006), "Effects of culture, gender, and moral obligations on responses to charity advertising across masculine and feminine cultures," Journal of Consumer Psychology, 16 (1), 45-56.

Ntzoufras, Ioannis (2009), Bayesian Modeling Using WinBUGS: Wiley.

Petty, Richard E. (1997), "The evolution of theory and research in social psychology: From single to multiple effect and process models of persuasion," in The Message of

Social Psychology: Perspectives on Mind in Society, Craig McGarty and S. Alexander Haslam, Eds. Oxford: Blackwell.

Petty, Richard E. and John T. Cacioppo (1986a), "The elaboration likelihood model of persuasion," in Advances in Experimental Social Psychology, L. Berkowitz, Ed. Vol. 19. New York: Academic Press.

Petty, Richard E. and John T. Cacioppo (1981), Attitudes and Persuasion: Classic and Contemporary Approaches. Dubuque, Iowa: W.C. Brown Co. Publishers.

---- (1986b), Communication and Persuasion: Central and Peripheral Routes to Attitude Change. New York: Springer-Verlag.

---- (1984), "The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion," Journal of Personality and Social Psychology, 46 (1), 69-81.

---- (1979), "Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses," Journal of Personality and Social Psychology, 37 (10), 1915-26.

Petty, Richard E., John T. Cacioppo, and Rachel Goldman (1981), "Personal involvement as a determinant of argument-based persuasion," Journal of Personality and Social Psychology, 41 (5), 847-55.

Petty, Richard E. and Duane T. Wegener (1999), "The elaboration likelihood model: Current status and controversies," in Dual-Process Theories in Social Psychology, Shelly Chaiken and Yaacov Trope, Eds. New York: The Guilford Press.

Reed, Americus, II (2004), "Activating the self-importance of consumer selves: Exploring identity salience effects on judgments," Journal of Consumer Research, 31 (2), 286-95.

Reimer, Torsten, Rui Mata, and Markus Stoecklin (2004), "The use of heuristics in persuasion: Deriving cues on source expertise from argument quality," Current Research in Social Psychology, 10 (6), 69-83.

Reingen, Peter H. and Jerome B. Kernan (1977), "Compliance with and interview request: A foot-in-the-door, self-perception interpretation," Journal of Marketing Research, 14 (3), 365-69.

Ridout, Martin, John Hinde, and Clarice G. B. Demetrio (2001), "A score test for testing a zero-inflated Poisson regression model against zero-inflated negative binomial alternatives," Biometrics, 57 (1), 219-23.

Shiv, Baba and Alexander Fedorikhin (1999), "Heart and mind in conflict: The interplay of affect and cognition in consumer decision making," Journal of Consumer Research, 26 (3), 278-92.

Simonson, Itamar and Amos Tversky (1992), "Choice in context: Tradeoff contrast and extremeness aversion," Journal of Marketing Research, 29 (3), 281-95.

Singelis, Theodore M. (1994), "The measurement of independent and interdependent self-construals," Personality and Social Psychology Bulletin, 20 (5), 580-91.

Sivadas, Eugene, Norman T. Bruvold, and Michelle R. Nelson (2008), "A reduced version of the horizontal and vertical individualism and collectivism scale: A four-country assessment," Journal of Business Research, 61 (3), 201-10.

Slovic, Paul (1966), "Cue-consistency and cue-utilization in judgment," The American Journal of Psychology, 79 (3), 427-34.

Sosik, John J. and Dong I. Jung (2002), "Work-group characteristics and performance in collectivistic and individualistic cultures," Journal of Social Psychology, 142 (1), 5-23.

Steenkamp, Jan-Benedict E. M. (2001), "The role of national culture in international marketing research," International Marketing Review, 18 (1), 30-44.

Stuart, Elnora W., Terence A. Shimp, and Randall W. Engle (1987), "Classical conditioning of consumer attitudes: Four experiments in an advertising context," Journal of Consumer Research, 14 (3), 334-49.

Tajfel, Henri and John C. Turner (1979), "An integrative theory of intergroup conflict," in The Social Psychology of Intergroup Relations, William G. Austin and Stephen Worchel, Eds. Monterey, CA: Brooks-Cole.

---- (1986), "The social identity theory of intergroup behavior," in Psychology of Intergroup Relations, William G. Austin and Stephen Worchel, Eds. Chicago: Nelson-Hall.

Triandis, Harry C. (1989), "The self and social behavior in differing cultural contexts," Psychological Review, 96 (3), 506–20.

Trompenaars, Fons and Charles Hampden-Turner (1997), Riding the Waves of Culture: Understanding Cultural Diversity in Business. London: Nicholas Brealey Publishing.

Tse, David K., Kam-hon Lee, IIan Vertinsky, and Donald A. Wehrung (1988), "Does Culture Matter? A cross-cultural study of excecutives' choice, decisiveness, and risk adjustment in international marketing," Journal of Marketing, 52 (4), 81-95.

Tversky, Amos and Daniel Kahneman (1974), "Judgment under uncertainty: Heuristics and biases," Science, 185 (4157), 1124-31.

Zajonc, Robert B. (1968), "Attitudinal effects of mere exposure," Journal of Personality and Social Psychology, 9 (2), 1-27.

Chapter 5

General Discussion and Conclusions

The three papers that constitute this thesis took a fresh look at implications of group membership on judgment and decision-making. Firstly, regardless of whether individuals are part of ad hoc groups or naturally formed groups, they sometimes face situations where they provide advice to others or make decisions that, to some extent, affect others. Secondly, individuals' cultural membership, and the extent that this membership is salient, can at times affect individuals' preferences, and the weight individuals assign to consensus information, as opposed to attribute information, when forming attitudes on products and services.

In Chapter 2 a simple conceptual model was introduced to address a long-standing issue on the difference between individuals' private risk preferences and their social risk preferences. The starting point is an assumption of other-regarding preferences, here interpreted as uniform altruism, so that each person in an ad hoc or naturally formed group accounts for others' risk preferences. It was demonstrated that individuals' social risk preferences can be written as a function of their private risk preferences and the beliefs-private differential. The parameter for the beliefs-private differential was shown to be increasing in altruism and the parameter can be concave, linear or convex. It was also established that the parameter is increasing and concave with regards to group size.

Chapter 3 investigated to what extent and how individuals preferences over private risk translated into preferences over social risk, a situation that is frequently encountered in multi-person households. Participants responded to two incentive-

compatible tasks with real monetary outcomes and also indicated beliefs on others' preferences. A series of interval-censored regressions demonstrated that individuals' social risk preferences can be described as a mixture of private risk preferences and the beliefs-private differential.

Chapter 4 reviewed and integrated the literature on individualist-collectivist differences in decision-making and information processing and also core results with regards to the impact of cultural salience on preferences. More specifically, it was hypothesized that when individuals were primed on their cultural identity they would be more inclined to regard a consensus cue as their reference group. In accordance with the prediction, it was shown that when individuals were shown pictures with Canadian motifs they switched information processing strategy; the number of attribute-related thoughts decreased and the number of consensus-related thoughts increased. In this sense they became more similar to collectivist members. However, the change in the number of attribute- versus consensus-related thoughts did not fully correspond to a change in the weights individuals assigned to two types of information; there was only an indication of a lessened effect of attribute-thought valence on attitudes, but not for consensus-thought valence.

However, several refinements are likely warranted to arrive upon more precise answers. With regards to the Chapter 3, another data set ought to be collected to study peoples' preferences in the loss domain. This would shed light on the social aspects of prospect theory's loss-gain differential. Moreover, it would be useful to collect more data for the given group sizes, but also to study decision-making in even larger groups, say $N = 12$. Moreover, in order to obtain a fuller test of the theoretical predictions regarding the link between private and social risk preferences one ought to compare the

beliefs-private risk differential for groups made up of relatives with groups made up of strangers. One could argue that empathy among the group members in the former group would be greater than in the latter group. As an alternative, one could try to manipulate inter-person empathy to obtain three different levels of group-empathy. Regarding Chapter 4, difficulties in obtaining a sample of Canadians participants lead to somewhat weak results. Still, having some non-Canadian participants and ask them to indicate to what extent they regard themselves Canadian could be useful as it allows the study of how a gradual transfer from non-Canadian to Canadian cultural group membership translates into a change in information processing strategies.

All in all, however, both the theoretical and empirical results obtained in the three separate papers illustrate the significance of incorporating 'others' in models of consumer behaviour; others' opinions and group membership spanning from small ad hoc groups and households to large groups as culture do impact peoples' judgment and decision-making.

Appendix A

Experimental Script: Private and Social Risk Preferences

Welcome to the study

These are your instructions

This is a study in decision making. Your participation is voluntary, but we think you will find it interesting. You will be paid for your participation and you will make some additional money. How much you receive will depend on chance and the choices you make. The instructions are simple and you will benefit from reading them carefully.

The problems are not designed to test you. What we want to know is what choices you would make. The only right answer is what you would choose. That is why the problems give you the chance of winning real money.

The study will proceed in two parts.

Part I involves making a series of economic choices.

Part II consists of some questions about yourself. Your answers to these questions will be kept confidential and used for statistical purposes only.

Instructions for Part I

Part I involves making a series of choices, as shown in the table below.

Decision	Option A	Option B
1	10% of $6.00, 90% of $4.80	10% of $11.55, 90% of $0.30
2	20% of $6.00, 80% of $4.80	20% of $11.55, 80% of $0.30
3	30% of $6.00, 70% of $4.80	30% of $11.55, 70% of $0.30
4	40% of $6.00, 60% of $4.80	40% of $11.55, 60% of $0.30
5	50% of $6.00, 50% of $4.80	50% of $11.55, 50% of $0.30
6	60% of $6.00, 40% of $4.80	60% of $11.55, 40% of $0.30
7	70% of $6.00, 30% of $4.80	70% of $11.55, 30% of $0.30
8	80% of $6.00, 20% of $4.80	80% of $11.55, 20% of $0.30
9	90% of $6.00, 10% of $4.80	90% of $11.55, 10% of $0.30
10	100% of $6.00, 0% of $4.80	100% of $11.55, 0% of $0.30

In the ten decisions you choose between Option A and Option B. Your payment depends on the outcome of a random number generator and your choices. The random number generator will draw a number between 1 and 100 and any number is equally likely to be chosen.

Please look at Decision 1 at the top of the table. Option A pays $6 if the random number generator draws 10 or lower, and pays $4.80 if it draws 11 or higher. This equates to a 10% chance of $6.00 and 90% chance of $4.80. Option B in Decision 1 pays $11.55 if the random number generator draws 10 or lower and pays $0.30 if it draws 11 or higher. This equates to a 10% chance of $11.55 and a 90% chance of $0.30. If you go down the table, the chance of the higher payoff for each option increases.

You have ten decisions to make. Nevertheless, we will only pay you for one of them. After you have finished the study, the random number generator will draw a number between 1 and 100 to select the decision that will determine your payment. If the number is 10 or lower, you will play out Decision 1, if the number is between 11 and 20 you will play out Decision 2, and so on. Each decision row is therefore equally likely to be chosen. Once the decision row has been decided, the random number generator will decide on the higher or the lower amount.

Practice Round

To illustrate the procedure, we will continue with an example where the payoffs are given as "XYZ". You will be asked to make ten choices. After you have completed your choices, all the draws will be performed using the random number generator to determine your payments in "XYZ".

Decision	Option A	Option B
1	10% of 6 XYZ, 90% of 4 XYZ	10% of 10 XYZ, 90% of 1 XYZ
2	20% of 6 XYZ, 80% of 4 XYZ	20% of 10 XYZ, 90% of 1 XYZ
3	30% of 6 XYZ, 70% of 4 XYZ	30% of 10 XYZ, 70% of 1 XYZ
4	40% of 6 XYZ, 60% of 4 XYZ	40% of 10 XYZ, 60% of 1 XYZ
5	50% of 6 XYZ, 50% of 4 XYZ	50% of 10 XYZ, 50% of 1 XYZ
6	60% of 6 XYZ, 40% of 4 XYZ	60% of 10 XYZ, 40% of 1 XYZ
7	70% of 6 XYZ, 30% of 4 XYZ	70% of 10 XYZ, 30% of 1 XYZ
8	80% of 6 XYZ, 20% of 4 XYZ	80% of 10 XYZ, 20% of 1 XYZ
9	90% of 6 XYZ, 10% of 4 XYZ	90% of 10 XYZ, 10% of 1 XYZ
10	100% of 6 XYZ, 0% of 4 XYZ	100% of 6 XYZ, 0% of 4 XYZ

DECISION ROW CHOSEN BY RANDOM NUMBER GENERATOR:

_____

In Row 5 you chose B.

YOUR PAYMENT DECIDED BY RANDOM NUMBER GENERATOR:

_____

Private Decision Task

On this screen you are asked to make ten choices regarding your preference for the payoffs given in the table below. For each of the ten decisions you select your preferred option – Option A or Option B. The option you select reflects your preference for a pair of payoffs. At the end of the study you will be paid according to the two draws of the random number generator and the choices you made.

There are no right or wrong choices, but think carefully about which option you prefer for each of the ten decisions.

Decision	Option A	Option B
1	10% of $6.00, 90% of $4.80	10% of $11.55, 90% of $0.30
2	20% of $6.00, 80% of $4.80	20% of $11.55, 80% of $0.30
3	30% of $6.00, 70% of $4.80	30% of $11.55, 70% of $0.30
4	40% of $6.00, 60% of $4.80	40% of $11.55, 60% of $0.30
5	50% of $6.00, 50% of $4.80	50% of $11.55, 50% of $0.30
6	60% of $6.00, 40% of $4.80	60% of $11.55, 40% of $0.30
7	70% of $6.00, 30% of $4.80	70% of $11.55, 30% of $0.30
8	80% of $6.00, 20% of $4.80	80% of $11.55, 20% of $0.30
9	90% of $6.00, 10% of $4.80	90% of $11.55, 10% of $0.30
10	100% of $6.00, 0% of $4.80	100% of $11.55, 0% of $0.30

DECISION ROW CHOSEN BY RANDOM NUMBER GENERATOR:

_____

In Row 5 you chose B.

YOUR PAYMENT DECIDED BY RANDOM NUMBER GENERATOR:

_____

Group Decision Task

On this screen you are asked to make ten choices regarding your preference for the payoffs that you and a group of n-1 other people will receive. Hence, the total group size is n. For each of the ten decisions you select your preferred option, Option A or Option B. The option you select reflects your preference for a pair of payoffs for you and your group members. All decisions are kept private, so other people will not know your decisions.

All the other group members will also do the same task. Following the completion of the task, one group member's preference will be randomly chosen and binding for the group. As the total group size is n, the chance that your preferences will be binding for the group is 1/n. Each group member will then receive the same resulting payment at the end of the study.

There are no right or wrong choices, but think carefully about which option you prefer for yourself and your group.

Decision	Option A	Option B
1	10% of $6.00, 90% of $4.80	10% of $11.55, 90% of $0.30
2	20% of $6.00, 80% of $4.80	20% of $11.55, 80% of $0.30
3	30% of $6.00, 70% of $4.80	30% of $11.55, 70% of $0.30
4	40% of $6.00, 60% of $4.80	40% of $11.55, 60% of $0.30
5	50% of $6.00, 50% of $4.80	50% of $11.55, 50% of $0.30
6	60% of $6.00, 40% of $4.80	60% of $11.55, 40% of $0.30
7	70% of $6.00, 30% of $4.80	70% of $11.55, 30% of $0.30
8	80% of $6.00, 20% of $4.80	80% of $11.55, 20% of $0.30
9	90% of $6.00, 10% of $4.80	90% of $11.55, 10% of $0.30
10	100% of $6.00, 0% of $4.80	100% of $11.55, 0% of $0.30

YOUR CHOICE WAS BINDING FOR THE GROUP OF N PEOPLE (yes/no):

_____

DECISION ROW CHOSEN BY RANDOM NUMBER GENERATOR:

_____

In Row 5, B was chosen.

YOUR PAYMENT DECIDED BY RANDOM NUMBER GENERATOR:

_____

Your Beliefs on Others' Preferences

On this screen you are asked to indicate your beliefs regarding an average other person's preference for the payoffs given in the table below. You will not be paid for this the purpose is to indicate your beliefs regarding others' preferences. For each of the ten decisions, indicate how you think an average other person would have chosen between Option A and Option B. The option you select reflects your beliefs as to an average other person's preference for payoffs.

There are no right or wrong choices, but think carefully about which option you believe an average other person would have chosen.

Decision	Option A	Option B
1	10% of $6.00, 90% of $4.80	10% of $11.55, 90% of $0.30
2	20% of $6.00, 80% of $4.80	20% of $11.55, 80% of $0.30
3	30% of $6.00, 70% of $4.80	30% of $11.55, 70% of $0.30
4	40% of $6.00, 60% of $4.80	40% of $11.55, 60% of $0.30
5	50% of $6.00, 50% of $4.80	50% of $11.55, 50% of $0.30
6	60% of $6.00, 40% of $4.80	60% of $11.55, 40% of $0.30
7	70% of $6.00, 30% of $4.80	70% of $11.55, 30% of $0.30
8	80% of $6.00, 20% of $4.80	80% of $11.55, 20% of $0.30
9	90% of $6.00, 10% of $4.80	90% of $11.55, 10% of $0.30
10	100% of $6.00, 0% of $4.80	100% of $11.55, 0% of $0.30

Your Comments on the Study

Here you have a chance to write down any comments on the study and/or thoughts that occurred to you while participating in the study and doing the economic choices for yourself and your group members.

In this survey, most of the questions are descriptive, and your responses will be kept confidential. Please think carefully about each question and give your best answer.

1. What is your age? _____ years

2. What is your gender?
01 Female
02 Male

3. Which of the following ethnic categories best describes you?
01 Asian
02 Black
03 First Nation
04 Hispanic
05 East Indian
06 Latin
07 Middle Eastern
08 White
09 Other

4. Where have you lived most of your life?
01 Town with less than 5,000 inhabitants
02 Town of 10,000 – 19,999 inhabitants
03 Town of 20,000 – 99,999 inhabitants
04 City of 100,000 - 1,000,000 inhabitants
05 City of more than 1,000,000 inhabitants
06 Other

5. What type of residence do you live in?
01 Owner-occupied house
02 Owner-occupied apartment
03 Rented house
04 Rented apartment
05 Cooperative
06 Rented room
07 Other

6. What is your major/background?
01 Business Administration
02 Economics
03 Engineering
04 Law
05 Medicine
06 Sciences
07 Social Sciences
08 Arts and Humanities
09 Other

7. What is your class standing/highest degree?
01 First year University/College
02 Second year University/College
03 Third year University/College
04 Fourth year University/College
05 Fifth year University/College
05 Master's
06 PhD
08 Other

8. What is your main source of finance for paying the tuition fee?
01 Yourself
02 Your parents
03 Scholarship
04 Loan
05 Other
06 Not a student

9. What is your typical means of transportation?
01 Walking
02 Bicycle
03 Public Transportation (Bus & Subway)
04 Car

10. Are you currently…
01 Single?
02 In a Relationship?
03 Married?
04 Separated, Divorced or Widowed?

11. How many people live in your household?
(Include yourself and all family members at your residence.)
01 1 person
02 2 people
03 3 people
04 4 people
05 5 people
06 More than 5 people

12. What is your average personal income per month?
(Consider all forms of income: salaries, tips, interest, dividends, scholarships, student loans, parental support, social security, child support and others.)
01 Less than $1000
02 $1,000 - $1,999
03 $2,000 - $2,999
04 $3,000 - $3,999
05 $4,000 - $4,999
06 $5,000 - $5,999
07 $6,000 - $6,999
08 More than $6,999

13. How many hours per week do you do paid work?
01 Less than 10 hours
02 10 – 19 hours
03 20 – 29 hours
04 30 – 39 hours
06 More than 39 hours

14. Do you prefer working individually or in a group?
01 Individually
02 In a group
03 Do not care

15. Do you consider yourself more, about as or less risk-loving than your peers when it comes to financial decision-making?
01 More risk-loving than my peers
02 About as risk-loving as my peers
03 Less risk-loving than my peers

16. How wealthy do you consider yourself?
01 Wealthier than my peers
02 As wealthy as my peers
03 Less wealthy than my peers

17. How often do you volunteer?
01 Regularly
02 Seldom
03 Never

18 How empathetic do you consider yourself?
01 More empathetic than my peers
02 As empathetic as my peers
03 Less empathetic than my peers

19. How much do you spend each month on things like rent, utilities, food, transportation and so forth (your individual expenses)?
01 Less than $600
02 $600 - $1,199
03 $1,200 - $1,799
04 $1,800 - $2,399
05 More than $2,399

20. Do you think surveys are useful?
01 Yes
02 No

The following statements concern your perceptions about yourself. Please read each item carefully and indicate how well the item describes you using a scale from 0 to 4, where 0 indicates that the item does not describe you well and 4 indicates that it describes you very well.

Does not describe me well				Describes me very well
0	1	2	3	4

1. I daydream and fantasize, with some regularity, about things that might happen to me.

2. I often have tender, concerned feelings for people less fortunate than me.

3. I sometimes find it difficult to see things from the "other guy's" point of view.

4. Sometimes I don't feel very sorry for other people when they are having problems.

5. I really get involved with the feelings of the characters in a novel.

6. In emergency situations, I feel apprehensive and ill-at-ease.

7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.

8. I try to look at everybody's side of a disagreement before I make a decision.

9. When I see someone being taken advantage of, I feel kind of protective towards them.

10. I sometimes feel helpless when I am in the middle of a very emotional situation.

11. I sometimes try to understand my friends better by imagining how things look from their perspective.

12. Becoming extremely involved in a good book or movie is somewhat rare for me.

13. When I see someone get hurt, I tend to remain calm.

14. Other people's misfortunes do not usually disturb me a great deal.

15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.

16. After seeing a play or movie, I have felt as though I were one of the characters.

17. Being in a tense emotional situation scares me.

18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them.

19. I am usually pretty effective in dealing with emergencies.

20. I am often quite touched by things that I see happen.

21. I believe that there are two sides to every question and try to look at them both.

22. I would describe myself as a pretty soft-hearted person.

23. When I watch a good movie, I can very easily put myself in the place of a leading character.

24. I tend to lose control during emergencies.

25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.

26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.

27. When I see someone who badly needs help in an emergency, I go to pieces.

28. Before criticizing somebody, I try to imagine how I would feel if I were in their place.

Appendix B

Experimental Script: Group Membership Salience and Persuasion: The Effect of Cultural Salience on Processing Strategies

Welcome to the studies

These are your instructions

You are about to participate in two studies. In the first study we are interested in assessing your general knowledge. The second study looks at your attitudes and preferences toward products. Your participation is voluntary, but we think you will find both studies interesting. You will be paid for your participation. The instructions are simple and you will benefit from reading them carefully.

The studies are not designed to test you. What we want to know is your general knowledge and your preferences. The only right answer is your answer.

The study will proceed in two parts:

Study 1: General knowledge

Study 2: Attitudes and preferences toward products

Finally, you will be asked some questions about yourself. Your answers to these questions will be kept confidential and used for statistical purposes only.

Study 1: General knowledge (cultural salience: high)

In this study we are interested in your general knowledge. We would like to know your ability to identify important persons, objects or events and the time period with which they are primarily associated.

You will be asked to look at a series of pictures. For each picture, please write down your best beliefs on the picture's referent and also try to indicate the approximate period of time in which the referent first existed (or, if fictitious, the time it was first created).

(Pic 1: Canadian flag, Pic 2: Wayne Gretzky, Pic 3: Celine Dion, Pic 4: Terry Fox, Pic 5: Mountie, Pic 6: Quarter)

When you are done, please continue to the next screen to start with Study 2.

Study 1: General knowledge (cultural salience: low)

In this study we are interested in your general knowledge. We would like to know your ability to identify important persons, objects or events and the time period with which they are primarily associated.

You will be asked to look at a series of pictures. For each picture, please indicate your best beliefs on the picture's referent and also try to indicate the approximate period of time in which the referent first existed (or, if fictitious, the time it was first created).

(Pic 1: Chinese Dragon, Pic 2: The Great Wall, Pic 3: Playing traditional Chinese musical instrument, Pic 4: Terracotta army, Pic 5: Chinese Opera singer, Pic 6: A character in a famous Chinese novel)

When you are done, please continue to the next screen to start with Study 2.

Study 2: Attitudes and preferences toward products (high motivation)

This study is part of an important market survey for a large-scale electronics manufacturer, which is planning to introduce a new camcorder in Western Canada and needs your opinion as a consumer.

In this survey you are part of a small and selected group of individuals in Western Canada whose opinion is being sought by the manufacturer.

Your opinion is highly relevant and will be weighted heavily in the decision to introduce the new camcorder. This product is currently planned to be marketed in Western Canada.

You will be provided with two sets of information regarding the new camcorder and the study will now continue on the next screen.

Study 2: Attitudes and preferences toward products (low motivation)

This study is part of a market survey for a large-scale electronics manufacturer, which is planning to introduce a new camcorder in Eastern Canada and needs consumer opinions about the new product.

You are part of a large opinion survey conducted across many universities and cities in Canada.

Your individual opinions are not important; they will be averaged across all respondents participating in this survey. This new product is currently planned to be marketed in Eastern Canada.

You will be provided with two sets of information regarding the new camcorder and the study will now continue on the next screen.

Test market results for the VXC-660 camcorder (Positive consensus cue)

The large-scale electronics manufacturer has performed a marketing test of the new camcorder VXC-660 in Western Canada, by letting 300 consumers in Western Canada use it.

Of the 300 consumers in Western Canada who have used it, 81% were extremely satisfied with the VXC-660 and less than 3% were extremely dissatisfied.

When you have read this information, please continue to the next screen.

Test market results for the VXC-660 camcorder (Negative consensus cue)

The large-scale electronics manufacturer has performed a marketing test of the new camcorder VXC-660 in Western Canada, by letting 300 consumers in Western Canada use it.

Of the 300 consumers in Western Canada who have used it, just under 20% were extremely satisfied with the VXC-660 and just under 50% were extremely dissatisfied with the product.

When you have read this information, please continue to the next screen.

Product description of the VXC-660 camcorder provided by a product testing agency (positive attribute information)

The new camcorder has been evaluated by an independent product testing agency, which has compared it with two leading competing brands. The product description is presented below.

The VXC-660 has a sharpness control and several other features that let you make manual adjustments to fine-tune your video. It has a good performance under low-light conditions; as long as there is a little bit of light in the room, it will produce viewable pictures. Of the three camcorders, it is the only one that has an image stabilizer and it generally produces a better picture quality than the other two brands.

Looking at the sound quality, the VXC-660 offers a comprehensive set of sound controls. These sound controls allow you to adjust the audio level of the microphone's channels, giving the user the ability to tailor the sound to specific situations, such as a rock concert, conversation or meeting. These features are not available in the two other brands.

The VXC-660 has several automatic features, such as auto exposure, auto-focus, auto white balance, automatic audio gain control and much more. By simply pressing a button, the VXC-660 can be operated in full automatic mode. In comparison with its competitors the VXC-660 does well. It has more automatic features and they are more refined, giving strong results without requiring any manual adjustments.

The imaging system of the VXC-660 takes separate readings of red, green and blue values for each pixel. For the VXC-660 this results in outstanding colour reproduction and accuracy; colours are bright and vivid without being oversaturated. The other two brands of camcorders have simpler imaging system; they only take one reading and do not measure up to the VXC-660 in terms of colour accuracy.

The VXC-660 comes with a palm-sized wireless remote control for turning the camcorder on or off, controlling the zoom, and executing the exposure functions, including focus adjustments. This allows you to film when the camcorder is tripod mounted, reducing the chance of unwanted movement. The effective distance of the remote control is five metres. None of the two competitors come with wireless remote controls.

All three brands evaluated were rated equally high in terms of ease of operation. There are no complicated instructions to follow - so simple that even children can use it. Intuitive user interfaces allows for seamless and easy switching between recording video and shooting stills, and between image/video capture and playback.

When you have read this information, please continue to the next screen.

Product description of the VXC-660 camcorder provided by a product testing agency (negative attribute information)

The prototype of the digital camcorder has been evaluated by an independent product testing agency, which has compared it to two leading competing brands. The product description is presented below.

The VXC-660 does not have a sharpness control or features to make manual adjustments to fine-tune the picture. It does not perform well under low-light conditions; if there is little light in the room, it will not produce viewable pictures. Of the three camcorders, it is the only one that does not have an image stabilizer and it generally produces a worse picture quality than the other two brands.

Looking at the sound quality, the VXC-660 does not offer a lot in terms of sound controls. Hence, in terms of adjusting the audio level of the microphone's channels, the sounds cannot be tailored by the user to specific situations, such as a rock concert, conversation or meeting. These features are available in the two other brands.

The VXC-660 has auto exposure, auto-focus, auto white balance, and automatic audio gain control. However, it cannot be operated in automatic mode by simply pressing a button as its competitors. In comparison with the two other brands, it does not do well. It has fewer automatic features and they are less refined, giving weak results with manual adjustments necessary.

The imaging system of the VXC-660 only takes one reading of red, green and blue values for each pixel. For the VXC-660 this results in unsatisfactory colour reproduction and accuracy; colours are dull and vague and not saturated enough. The other two brands of camcorders take separate readings of red, green, and blue values and therefore perform much better than the VXC-660 in terms of colour accuracy.

The VXC-660 does not come with a wireless remote control. Hence, you cannot film when the camcorder is tripod mounted without touching it, which could result in unwanted movement. Both of the other camcorders come with palm-sized wireless remote controls for turning the camcorders on or off, controlling the zoom, and executing the exposure functions, including focus adjustments. The effective distance of the remote controls is five metres.

All three brands evaluated were rated equally high in terms of ease of operation. There are no complicated instructions to follow - so simple that even children can use it. Intuitive user interfaces allows for seamless and easy switching between recording video and shooting stills, and between image/video capture and playback.

When you have read this information, please continue to the next screen.

Your attitudes toward the VXC-660 camcorder

The following questions concern your attitudes regarding various aspects of the VXC-660 camcorder. Please read each question carefully and indicate your response by using a scale from -4 to 4, where -4 means a negative attitude and 4 means a positive attitude.

1. To what extent would you consider purchasing the VXC-660 camcorder?

2. What is your favourability towards the VXC-660 camcorder?

3. To what extent do you regard the VXC-660 camcorder a useful product?

4. To what extent do you regard the VXC-660 camcorder a good product?

When you are done, please continue to the next screen.

Your thoughts on the VXC-660 camcorder

In this section you are given 3 minutes to list any thoughts that occurred to you about the VXC-660, while reading the product description.

When you are done, please continue to the next screen.

In this section we would like to ask you a few questions regarding your perceptions of the VXC-660 camcorder and the two sets of information on the VXC-660.

1. To what extent were you interested in reading the product description of the VXC-660 camcorder?

1	2	3	4	5	6	7
Not interested						Highly Interested

2. To what extent did you feel involved when reading the product description of the VXC-660 camcorder?

1	2	3	4	5	6	7
Not involved						Highly involved

3. To what extent did you feel that the product description of the VXC-660 portrayed it as having positive features?

1	2	3	4	5	6	7
Few positive features						Many positive features

4. To what extent did you feel that the product description of the VXC-660 portrayed it as having negative features?

1	2	3	4	5	6	7
Many negative features						Few negative features

5. To what extent did you feel that the product description of the VXC-660 portrayed it as being superior to the competing brands?

1	2	3	4	5	6	7
Inferior						Superior

6. To what extent did you feel that the test market results for the VXC-660 were favourable?

1	2	3	4	5	6	7
Unfavourable						Favourable

7. To what extent did you feel that the test market results and the product description for the VXC-660 were compatible?

1	2	3	4	5	6	7
Incompatible						Compatible

8. To what extent did you feel that the test market results and the product description for the VXC-660 were similar?

1	2	3	4	5	6	7
Dissimilar						Similar

9. Finally, please indicate your estimate of the percentage of customers in the test market group who were extremely satisfied with the VXC-660

Here we are interested in the reasons that underlie preferences for alternatives and we want to look into the choices that people make after they have narrowed a selection down to few alternatives that differ along two dimensions. You may assume that the alternatives are similar on all dimensions except the two on which the products are described. For each shopping scenario first write a sentence or phrase giving a reason for selecting one option over the others, and then indicate the choice.

1. Digital SLR cameras

	Reliability rating of expert panel	Maximum autofocus range (meters)
Typical range	40—70	12-28
Option A	45	25
Option B	55	20
Option C	65	15

2. Laptop computers

	Hard disk capacity (GB)	Maximum battery life (hours)
Typical range	80—200	4-10
Option A	180	5
Option B	100	9
Option C	140	7

3. Television sets

	Screen size (inches)	Resolution (megapixels)
Typical range	26—42 inches	0.8-1.6
Option A	28 inches	1.4
Option B	40 inches	1.0
Option C	34 inches	1.2

4. Laser printers

	Print speed (pages per minute)	Tray capacity (sheets)
Typical range	10—26	100-300
Option A	13	280
Option B	18	200
Option C	23	120

Here we would like to ask you to write down everything you can remember from the product description of the VXC-660 camcorder.

When you are done, please continue to the next screen.

In this section we would like to ask you to comment on what you think the purpose of the study was.

When you are done, please continue to the next screen.

The following statements concern your perceptions about yourself. Please read each item carefully and indicate to what extent you agree on the statements, using a scale from 1 to 9, where 1 indicates that you strongly disagree on the statement, and 9 indicates that you strongly agree on the statement.

Strongly disagree							Strongly agree	
1	2	3	4	5	6	7	8	9

1. My happiness depends very much on the happiness of those around me
2. I would do what would please my family, even if I detested that activity
3. I usually sacrifice my self-interest for the benefit of my group
4. I enjoy working in situations involving competition with others
5. The well-being of my co-workers is important to me
6. I enjoy being unique and different from others in many ways
7. Children should feel honoured if their parents receive a distinguished award
8. I often “do my own thing”
9. Competition is the law of nature
10. If a co-worker gets a prize, I would feel proud
11. I am a unique individual
12. I would sacrifice an activity that I enjoy very much if my family did not approve of it
13. Without competition it is not possible to have a good society
14. I feel good when I cooperate with others

In this survey, most of the questions are descriptive, and your responses will be kept confidential. Please think carefully about each question and give your best answer.

1. What is your age? _____ years

2. What is your gender?
01 Female
02 Male

3. Which of the following ethnic categories best describes you?
01 Asian
02 Black
03 First Nation
04 Hispanic
05 East Indian
06 Latin
07 Middle Eastern
08 White
09 Other

4. Were you born and/or raised in Canada?
01 Yes
02 No

5. Where have you lived most of your life?
01 Town with less than 5,000 inhabitants
02 Town of 10,000 – 19,999 inhabitants
03 Town of 20,000 – 99,999 inhabitants
04 City of 100,000 - 1,000,000 inhabitants
05 City of more than 1,000,000 inhabitants
06 Other

6. What type of residence do you live in?
01 Owner-occupied house
02 Owner-occupied apartment
03 Rented house
04 Rented apartment
05 Cooperative
06 Rented room
07 Other

7. What is your major/background?
01 Business Administration
02 Economics
03 Engineering
04 Law
05 Medicine
06 Sciences
07 Social Sciences
08 Arts and Humanities
09 Other

8. What is your class standing/highest degree?
01 First year University/College
02 Second year University/College
03 Third year University/College
04 Fourth year University/College
05 Fifth year University/College
05 Master's
06 PhD
08 Other

9. Are you currently…
01 Single?
02 In a Relationship?
03 Married?
04 Separated, Divorced or Widowed?

10. How many people live in your household?
(Include yourself and all family members at your residence.)
01 1 person
02 2 people
03 3 people
04 4 people
05 5 people
06 More than 5 people

11. What is your average personal income per month?
(Consider all forms of income: salaries, tips, interest, dividends, scholarships, student loans, parental support, social security, child support and others.)
01 Less than $1000
02 $1,000 - $1,999
03 $2,000 - $2,999
04 $3,000 - $3,999
05 $4,000 - $4,999
06 $5,000 - $5,999
07 $6,000 - $6,999
08 More than $6,999

12. How many hours per week do you do paid work?
01 Less than 10 hours
02 10 – 19 hours
03 20 – 29 hours
04 30 – 39 hours
06 More than 39 hours

13. How wealthy do you consider yourself?
01 Wealthier than my peers
02 As wealthy as my peers
03 Less wealthy than my peers

14. How often do you volunteer?
01 Regularly
02 Seldom
03 Never

15. How much do you spend each month on things like rent, utilities, food, transportation and so forth (your individual expenses)?
01 Less than $600
02 $600 - $1,199
03 $1,200 - $1,799
04 $1,800 - $2,399
05 More than $2,399

16. Do you think surveys are useful?
01 Yes
02 No