



Università degli Studi di Cagliari

DOTTORATO DI RICERCA IN ECONOMIA

Ciclo XXVIII

**Four Essays on Strategic Behavior, Empathy and Gender
Differences in Voluntary Provision of Public Goods and
Responsible Consumption**

Settore Scientifico-Disciplinare di Afferenza: Secs-P/01

Presentata da:	Alejandra Alicia Vásquez Alvarado
Coordinatore del Dottorato:	Prof. Romano Piras
Tutore del Dottorato:	Prof. Vittorio Pelligra

Esame finale Anno Accademico 2015-2016

Tesi discussa nella sessione d'esame marzo-aprile 2017

Al sol, al mar, a las estrellas y a todas las sonrisas que acompañan este camino!

Acknowledgement

It's time to give: THANKS

This thesis is marked by a path of gratitude, a true Buoncaminno.

I can assure you that each of these pages does not just contain words and abstract concepts. Each line talks about encounters, interactions, reflections, memories, trips, presentations ... lived emotions which with time I came to recognize, interpreted and appreciate.

The richness of this work lies in its interdisciplinary approach, to have known each author through entering into a dialogue of thought.

In 1916 exactly 100 years ago in Freiburg Edith Stein defended her doctoral thesis titled: "The problem of the Empathy". This truth-loving philosopher has been a seminal source of inspiration and motivation to me.

Like Edmund Husserl and his phenomenological research group who was Edith Stein's mentor, I feel immense gratitude for my Great Supervisor Vittorio Pelligra who thanks to his intellectual intuitions, line of research and his human qualities, -and in particular his patience and wisdom meant- that he was a true guide on this road of research. Thanks to his trust in me, I was encouraged to challenge myself seeking new areas of knowledge, to employ new scientific instruments as essential tools to respond to concerns about the economic behaviour that our society needs today.

It is motivating and gratifying, working with people with innovative ideas, who are creating a civil economy from my immediate research group. My gratitude goes to Tommaso Reggiani co-author of the essay: Empathy and Strategic Behavior in Simple Experimental Games (Chapter 2) who in an exchange of knowledge helped me to grow and discover new areas in data analysis and take the first steps in conducting an experiment. A special thanks to Leonardo Bechetti and Francesco Salustri, co-authors of the working-paper: Empathy In Socially Responsible Consumption: An Experimental

Investigation Using The Vote-With The Wallet Game (chapter 4). With them I was able to perform my first two lab experiments (Chapters 3 and 4).

A special thanks to Sophia University professors and students, through its interdisciplinary research and teaching method which gave me courage to go ahead with my companions on this road: Piero Coda, Luigino Bruni (a teacher of gratuitousness), Benedetto Gui and Luca Crivelli, who have taught me to love Sophia, were a great source of inspiration for me.

I also have an immense gratitude to Marta P., Stefania M., Farideh T., Tiziana M., Nicola V. A particular thanks to my friend Lorraine Lipson who has made it possible for this thesis to be readable. Thank you to Paul 'O Hara for the intellectual and fruitful dialogue.

Thanks too to all the PhD colleagues I met on the way both in Cagliari, Bilbao and Chicago. And thanks to the team of researchers and professors from the Faculty of Economics at the University of Cagliari and University of Basque Country.

Thanks to Urs Fischbacher and his research team from the University of Konstanz for the course on Z-tree a software for lab experiments, as well as to Maria Bigoni of the University of Bologna for your work for science.

Thanks to the feedback that this work received at the ESA meeting of Heilderberg-Germany 2005 with a special thanks to Linda Kamas for an exchange of ideas.

In Chicago, thanks to the professors of De Paul University for the feedback to the presentation made in May 2016 with a special thanks to Rafael Tenorio, Brian Phelan, Gabriella Bucci.

Thanks to Richard Thaler and his team for allowing me to participate in their Behavioral Economics course at the University of Chicago.

Thanks to the Summer Workshop in Experimental Economics at the University of Sassari and in particular to Professors Bryan McCannon and Greg De Angelo of West Virginia University for their valuable comments on my presentation as well as generating a research network in the area of strategic thinking and empathy.

Thanks to the feedback following Workshop presentations to the youngest researchers in Paris, Quito and Nairobi.

A special thanks to John and Julie Mundell for allowing me to do experiments at their Indianapolis Company and a thank you to all the workers who generously participated in this project.

Many friends have shared stories and adventures on this wonderful journey that has contributed to who I am beginning with giving thanks to the Sardinian people where I spent most of these years and that have marked my life in a unique way, in Sardinia many opened their homes and hearts to me from the beginning. A thank you forever to Maria M., Mina F., Madda M., Laura L., Adele B., Ylenia B., Luana Z., Roberta, Sara, Monia, P.Enrico D., Roby de A., Carla Z., and to the whole group of contemporary dance.

Thanks go to the group of friends from volunteers and Youth for a United World. Thanks to Martin M. for his English teaching and a thank you to my friend Claudia Berlucchi, in Firenze, a special thanks a Vittorio Z. Friends from my time to Bilbao, Miriam, Ainara, Lide, David, Jon, Sorkunde and Iñigo, Iñaki, Xemi, Massimo, I hold vivid and very special memories.

To my close friends in Germany who were a support in my passage through conferences and courses thanks to Julia H., Claudia V., M. Chiara L.

My gratitude is still profound for the many people that I discovered day by day. Without a doubt they have all built within me the person that I am. A deep thanks goes to my parents: Alicia and Ismael, who are always giving the best of themselves with constant love to those around them. They taught me to be strong and gave me the sensitivity to make the world a fairer place, my thanks endless. To my brother Francisco, a formidable person with infinite generosity, who knows how to get the best and the worst out of me. Thank you for being and always present for me. And last to my roots, to all my Ecuadorian and Chilean families who have laid the foundation for me to find the keys to reading in all the new cultures that I have been exposed to that have transformed me into a woman who feels the whole world as her home.

Table of Contents

<u>Introduction</u>	<u>5</u>
---------------------	----------

Chapter 1

THE ROLE OF EMPATHY IN INTERPERSONAL RELATIONS AND ECONOMIC INTERACTIONS

1. <u>Introduction</u>	<u>6</u>
2. <u>Brief Background on Empathy in Economics</u>	<u>7</u>
2.1. <u>Adam Smith's Relational Approach</u>	<u>7</u>
2.2. <u>Etymology of the Term Empathy</u>	<u>8</u>
2.3. <u>Game Theory: A Theory of Interpersonal Behaviour in Economic Interactions</u>	<u>9</u>
3. <u>Empathy: A Multidisciplinary Approach</u>	<u>10</u>
3.1. <u>Philosophy: Phenomenological Review of the Notion of Empathy</u>	<u>10</u>
3.1 <u>Neuroscience and Neuroeconomics: How the Brain Makes Decisions</u>	<u>12</u>
3.2 <u>Biology, Ethology and Psychology: Empathy in Humans and Non-Human Animals</u>	<u>14</u>
3.3 <u>Measurement: Psychometric Instruments</u>	<u>18</u>
4. <u>Implications of Empathy for Economics</u>	<u>21</u>
4.1 <u>Emotions in Decision Making</u>	<u>21</u>
4.2 <u>Empathy and Behavioural Economics</u>	<u>22</u>
5. <u>Discussion</u>	<u>25</u>
6. <u>Open Questions and Rationale</u>	<u>26</u>
<u>References</u>	<u>28</u>

Chapter 2

EMPATHY AND STRATEGIC BEHAVIOUR IN SIMPLE EXPERIMENTAL GAMES

1. <u>Introduction</u>	30
2. <u>Empathy, Strategic Thinking and Pro-Social Behavior</u>	31
3. <u>Experimental Design</u>	34
3.1. <u>Hypothesis</u>	35
3.2. <u>Procedure</u>	35
4. <u>Results</u>	36
5. <u>Conclusions</u>	49
<u>References</u>	51

Chapter 3

EMPATHY IN SOCIALLY RESPONSIBLE CONSUMPTION: AN EXPERIMENTAL INVESTIGATION USING THE VOTE-WITH-THE-WALLET GAME

1. <u>Introduction</u>	56
2. <u>Literature Review</u>	57
2.1. <u>Redistribution and Conformity</u>	57
2.2. <u>Framing in Public Good Games and Empathy</u>	58
3. <u>The Model</u>	60
4. <u>Experimental Design</u>	62
4.1. <u>Experimental Procedures</u>	63
5. <u>Hypothesis Testing</u>	65
5.1. <u>Empirical Findings</u>	67
5.2. <u>Empathy Findings</u>	69
5.3. <u>Dynamic Descriptive Findings</u>	70
5.4. <u>Dynamic Hypothesis Testing</u>	74
5.5. <u>Econometric Findings</u>	75
6. <u>Conclusions</u>	80
<u>References</u>	81

Chapter. 4

GENDER DIFFERENCES IN SOCIALLY RESPONSIBLE CONSUMPTION: AN EXPERIMENTAL INVESTIGATION

1. <u>Introduction</u>	87
2. <u>The Model: The Vote with the Wallet Game</u>	90
3. <u>Experimental Design</u>	91
3.1. <u>Hypothesis Testing</u>	93
3.2. <u>Experimental Procedures</u>	93
4. <u>Results</u>	94
5. <u>Empirical Findings</u>	94
6. <u>Conclusions</u>	101
<u>References</u>	102

<u>List of Abbreviations and Glossary of Terms</u>	106
--	-----

APPENDIX

<u>Appendix Experiment 1</u>	117
<u>Appendix Experiment 2</u>	132
<u>Appendix Experiment 3</u>	152

Introduction

The present work examines the topics of strategic behavior, empathy and gender differences in responsible consumption. In order to analyse such issues, we turned to the rapidly growing field of behaviour economics which represents a merger of a variety of different scientific disciplines (economics and psychology above all) and, as such, gives us a unique opportunity to study a variety of aspects (both economic and not) characterizing the behavior of human beings.

In the first chapter we present an overview of the main insights into the concept of empathy as interpreted in a range of disciplines (namely, economics, philosophy-phenomenology, neuroscience, biology, psychology and ethology). Empathy directly connects to the topic of prosocial behaviour which have been widely explored and reported in the literature. However, it is worth noting that the attention of economists on this subject is relatively recent. We can, thus, confidently predict that this topic, as well as behavioural economics in general, are going to contribute significantly over time to general economic theory.

In the second chapter we examine how do economists study the role played by empathy in simple strategic games. We analyze a series of strategic and prosocial games that allow us to test whether any correlation between empathy and participants' behavior exists.

In the third chapter we examine how empathy works in an interactive multiperson prisoner's dilemma game. Moreover, we analyse whether priming (that allows distinguishing between a conventional and a legal socially responsible product), has an impact on participants' choices. We further explore the possibility that empathy acts as a sort of driver of prosocial behavior.

In the fourth chapter we extend the analysis of the repeated multiperson prisoner's dilemma game that mimics the characteristics of the choice between a conventional and a socially responsible product, in order to explore the existence of any gender differences in the Vote with the Wallet experiment.

Chapter 1

The Role of Empathy in Interpersonal Relations and in Economic Interactions

1. Introduction

What is the rationale for incorporating the notion of empathy in our analysis? In this chapter presenting a literature review of the historical and multidisciplinary literature related to the importance of empathy for the discipline of economics the aim is to provoke reflection on “empathy” as a significant variable in our analysis.

First, this review begins with a historical analysis of the term and how this has been associated with economics since the inception of the discipline.

Second, to gain a broader understanding and deepen reflection of this term, a brief multidisciplinary survey of the thought of the most seminal thinkers follows, beginning with the philosophy and phenomenological analysis of Edith Stein’s thought as expounded in her treatise on “The Problem of Empathy” ([Stein 1917](#)).

Third, recent scientific advances in the area of neuroscience, such as mirror neurons ([Rizzolatti et al. 1996](#)) and understanding of the location of emotions in the brain ([Singer et al. 2004\(b\)](#), [2005](#), [2006](#), [2009](#), [2012](#)) including “empathy” and their application in the relatively new economic discipline of neuroeconomics are highlighted.

Fourth, this review also covers literature related to non-human species in ethological research ([de Waal 2000](#), [2002](#), [2008](#), [2016](#)) providing important insights into human “empathy” and “altruism”. From the psychological literature we draw the three psychometric tests used in our experiment will be presented.

Fifth, an extremely valuable recent investigation by ([Elster 1998](#), [Wälde 2015](#)) working in the field of emotions in economics outlining the contribution of the concept of “empathy” will be covered in this review and several experiments in which subjects’ empathy is measured in economics’ games will be described.

Finally, a section of discussion and open questions that remain from the research will be presented.

2. Brief Background on Empathy in Economics

“Già non attendere’ io tua dimanda, s’io m’antuassi, come tu t’inmii”.

Dante Par. IX, 80-81

2.1 Adam Smith’s Relational Approach

It is well known, at least since Aristotle, that the human being is by nature a “social animal”, a relational being, meaning that she can fully express her humanity only in relation with others ([Aristotle Politics I-VI](#)).

On the other hand, John Stuart Mill highlighted the main feature of man as being an economic actor (“*Homo Economicus*”), defining him as follows:

a being who desires to possess wealth, and who is capable of judging the comparative efficacy of the means for obtaining that end.” ([Mill 1836](#), p.321).

Adam Smith identifies the notions of “sympathy” and “self-interest behaviour” as aspects of human nature that translate into opposing forces of experience in a person’s inner being ([Smith 1759, \[1976\]](#)).

With regard to the former, Adam Smith is the first known economic writer to address the human ability to identify with other fellow human beings and experience their feelings. In his *Theory of Moral Sentiments* (1759 [1976]), he senses and describes the notion of “sympathy” for the first time as follows:

How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it. Of this kind is pity or compassion, the emotion which we feel for the misery of others, when we either see it, or are made to conceive it in a very lively manner.

Later in his writing, he effectively describes this “identification mechanism” in the following terms:

[...] By the imagination we place ourselves in his situation, we conceive ourselves enduring all the same torments, we enter as it were into his body, and become in some measure the same person with him, and thence form some idea of his sensations, and even feel something which, though weaker in degree, is not altogether unlike them. His agonies, when they are thus brought home to ourselves, when we have thus adopted and made them our own, begin at last to affect us, and we then tremble and shudder at the thought of what he feels (Smith 1759, p.9).

By using the notion of “sympathy” related to notions such as: *fellow feeling* and *social passions*. Smith appears to be striving to fill a linguistic gap in the English language of his time which would later be filled by the term “empathy”.

2.2 Etymology of the Term Empathy

Even though the notion of “empathy” is widespread in the history of human thought, the word “empathy” itself is a relatively recent addition to the English lexicon. The English word derives from the ancient Greek ἐμπάθεια-*empathēia* (meaning physical affection), composed of the words *en* (in, into) and *pathos* (passion, suffering) (Liddell 1940).

However, the word first appeared in the contemporary era in its German adaption from Greek as: *Einfühlung* (feeling into), or *Einfühlungsvermögen* (the power of feeling into) and coined by the German philosophers Rudolf Hermann Lotze and Robert Visser in late 19th century. The term was extensively referred to by the German philosopher Theodor Lipps. This German term was subsequently translated into English as the word “empathy” by the British psychologist Edward Bradford Titchener in 1909 (as cited Preston and de Waal 2002).

2.3 Game Theory: A theory of Interpersonal Behaviour when Decision-Makers Interact

One of the leading game theorists claims that “the Homo Economicus” must be empathetic to some degree (Bimmore 1994, p.28). Moreover, the human capacity for “empathy” allows us to understand the nature of strategic interactions, which is important for understanding the other’s thought processes.

Game Theory provides a theory of interpersonal behaviour in economic interactions, in which decision making i.e. the act of having to decide what to do and trying to anticipate the other’s behaviour are the key elements (Singer and Fehr 2005). Another way of describing the aim of Game Theory is that it provides an understanding of how individuals form beliefs and how they act optimally given these beliefs (Grohn, Huck and Valasek 2014).

Game Theory also refers to the central role of direct, conscious and strategic interactions between individuals that has begun to be essential in economics. Likewise, the crucial concept of the “common knowledge assumption” explains how individuals form beliefs and learn from their actions involving their relationship with others. This concept can be expressed as: “they know that the others know”, meaning that individuals involved reflect on the actions of the others with whom they interact and know that the others do the same (Lewis, 1969, Aumann 1976, Kirman and Teschl 2010).

The “Theory of Mind” (ToM) expounded by Premack and Woodruff (1978) also provides understanding of the elements involved in strategic interactions. They describe the capacity for “mentalizing” which is seen as an essential component in strategic thinking and an important component of what is referred to as “cognitive empathy” (Singer and Fehr 2005). In the next chapter, our experiment analyses the correlation between strategic actions and empathy drawing on the Theory of Mind (ToM) in interpreting our findings.

3. Empathy Multidisciplinary Approach

“Only he who experiences himself as a person, as a meaningful whole, can understand other persons”

-Stein 1917, p.116

3.1 Philosophy: Phenomenological Review of the Notion of Empathy

In 1916 Edith Stein wrote “On the Problem of Empathy” for her doctoral thesis in philosophy under the supervision of Edmund Husserl, founder of “phenomenology¹” Stein applies this phenomenological method in order to study *the essence of empathy* as a first order primordial experience.

The main question that Stein addresses in her thesis is: How is it possible to understand others’ minds, psychological states and experiences? How is it possible to know these things? Her response is that we recognise these things through “empathy”. We would agree with McDaniel, 2016 that:

Empathy is an irreducible intentional state in which both other persons and the mental states of other persons are *given* to us (Mc Daniel, 2016 p.199).

However, she goes further in understanding that the problem of empathy involves the problem of accounting for how other people and their experiences can be given to us despite their *distinctness* from us and she identifies different modes of *givenness* – meaning intentional states in which *the other* can be manifested to us. She shows how in the interaction with the other we are not theoretical or unobservable entities rather we share similar perceptions of our emotions with the other.

In order to explain Stein’s research method, we consider her three key insights:

1. Direct Perception - The experience from the other comes directly into one's own awareness. Empathy is conceived as an act of “perception” and the object of that act is the embodied, embedded experience of another, as it is given in consciousness.

¹ Phenomenology is the study of structures of consciousness as experienced from the first-person point of view. The central structure of an experience is its intentionality, its being directed toward something, as it is an experience of or about some object (Smith 2013).

(Stein 1917, p.14).

For Stein underlying empathy is always a *primordial* experience (by which she means, immediate, in the here-and-now) involving direct co-perception of body and mind together in context. She distinguishes empathy from related phenomena, such as “fantasy”, or “contagion” (Meneses and Larkin 2012).

2. Experiential Projection- Stein explains that “empathy” can be conceived as an experiential, non-intellectual, and intuitive kind of projection. (Stein 1917, p.20). That is, the experienced projection does not provoke intellectual simulation but is immediately co-perceived as external. In both empathic projections and empathic perceptions, however Stein argues that subject and object are not one, because they do not have identical experiences.

3. Interpretative Mentalizing – Stein argues that what is directly and intuitively given of the other’s experience (during direct perception and/or experiential projection) is represented, in awareness, as a “mental object”. Through the process of mentalization i.e. the making of an experience into a mental object “empathy” becomes comprehension/knowledge about the other.

By way of clarification of this last point Stein provides the following insights:

- She explains how the other person can *judge better* than I can judge myself. For instance, the other perceives that when I do a good act that I am looking for approval, but I believe that I am doing the act with compassion. In this way “empathy” and internal perception work together to give me more clarity about myself (Stein 1917, p.192).

- Stein shows how through empathizing, I can understand as I am, experimenting with my values and intentional states.

- It should be noted that Stein holds a different viewpoint about “oneness” to that of Lipps cited in (Gurmin 2007, p.106). Lipps holds that empathy has a component of “oneness” by which he means that when we merge with the other person we forget ourselves. Stein accepts “that it is possible to be affected by imitation and contagion as such but we are not affected in the sense that we sub-merge

ourselves into the other individual” to become “one” (Stein 1917, p.17) as Lipps argues.

According to Stein “the primordial nature of our empathic experience prevents the mergence” as held by Lipps Stein cited in (Gurmin 2007, p. 107) as held by Lipps. While she acknowledges that “we can be saturated by transferred feelings, we live in them and thus in *ourselves*” maintaining our primordality cited in (Gurmin 2007, p. 107).

3.2 Neuroscience and Neuroeconomics: How the Brain Makes Decisions

“I do not ask the wounded person how he feels, I myself become the wounded person.”

– Walt Whitman, Song of Myself v.33

Neuroscience is the study of the nervous system and one of the main questions that researchers attempt to answer is: How does the brain work?

Currently the disciplines of neuroscience, psychology and economics are working together in a new discipline called neuroeconomics. The main research question posed by researchers in this relatively new discipline is: How does the brain generate preferences and make choices? (Singer and Fehr 2005; Singer et al. 2006; Fehr and Camerer 2007). In recent decades with advances in scientific technologies, it is now possible to analyse the brain in vivo² with implications for our understanding of empathy.

The first relevant neuroscientific discovery involves the identification of what has been referred to as mirror neurons (Rizzolatti et al. 1996) described as:

action observation produces in the observer the automatic activation of the same neural mechanism activated by action (as cited Gallese 2006, p.18)

² Neuroscience uses two main tools: PET - Position Emission Tomography which operates by showing the parts of the brain that are active using glucose and fMRI – Functional Magnetic Resonance Imaging, which measures the underlying level of oxygen in the brain (Gurmin 2007).

The second finding comes from social neuroscience ([Singer 2006](#)) with a distinction drawn between Theory of Mind (ToM) and empathy:

Theory of Mind– refers to our ability to understand mental states such intentions, goals and beliefs, and relies on structures of the temporal lobe and the pre-frontal cortex. In contrast, empathy refers to our ability to *share feelings* (emotions and sensations) of others and relies on sensorimotor cortices as well as limbic and para-limbic structures. ([Singer 2006](#) p.855)

Singer (...) observes that even though empathizing and mentalising follow different neural pathways in the brain, that these are intertwined in our mind system.

The third neurological finding underlines that a contextual approach for understanding empathy is crucial, de Vignemont and Singer 2006 highlight that empathy is given to us unconsciously as such rather than automatically where empathy could then become emotional contagion or imitation.

This explanation can be considered as too simplistic, holding that empathy is automatically “mirrored” as such. It is important to understand the real causes of empathic behaviour. Indeed, in recent studies ([Singer and Lamm 2009](#)) show that empathy is a highly flexible phenomenon, and that vicarious responses are malleable with respect to a number of factors, such as contextual appraisal, the interpersonal relationship between empathizer and other, or the perspective adopted during observation of the other.

Lately studies exploring empathy and affective states in neuroeconomics present the role of the Anterior Insula (AI) in processing of risk, risk prediction error, and uncertainty in decision making ([Bernhardt and Singer 2012](#)).

[Preston and de Waal 2002](#) discuss the evolution of empathy giving the phenomenon a neurological foundation. The phenomenon of empathy is generated through “imitation” at an automatic and unconscious level. They note that as mirror neurons operate in response to motor actions in an automatic way that even in mentalizing we internalize others’ states. We do this through perception of what others are doing with their motor actions.

3.3 Biology, Ethology and Psychology: Empathy in Humans and Non-Human Animals

Why do people help others, often at considerable cost to themselves? What does this behavior tell us about the human capacity to care, about the degree of interconnectedness among us, about how social an animal we humans are?

-Batson, Ahmad and Lishner, p.494

Continuing with an interdisciplinary approach, first we want to clarify some crucial terms that relate to empathy and altruism that have been used in the disciplines of biology, psychology and ethology. We will then present the empathy-altruism hypothesis put forward by the social psychologist C. Daniel Batson (Batson et al. 1981, Batson and Shaw 1991, Batson et al. 2009, Batson 2010) and we will briefly present the main insights from the ethologist Frans de Waal (de Waal 2000, 2008; Preston and de Waal 2002).

The conversation between biologist and psychologist centres on the purpose of altruistic and selfish behaviour. In this context it is important to underline that the *effects* produced by an action are different to the *motivations* for such an action. De Waal (2008) put forward:

The evolutionary biologist hijacking the motivational terms and has been unhelpful for the communication about motivation per se. (de Waal 2008, p.280)

For this reason, biologists such as Mayr 1961 and Tinbergen 1963 (as cited in de Waal 2008) distinguish between *ultimate (functional) and proximate (motivational) causes*. By *ultimate cause* they understand why a behaviour evolved over thousands of generations, depending on its adaptive capacity for fitness. By *proximate cause* they refer to the immediate situation that triggers behaviour, such as neural processes and the role of learning and physiology (de Waal 2008).

Biologists and psychologists therefore draw on different theories that purport to explain the purpose of altruistic behavior. Fundamentally the biologist argues for a functional purpose for altruistic behaviour explained by: The *kin selection theory and reciprocal altruism theory* (Dawkins 1976 and Trivers 1971), while the psychologist argues for a motivational purpose for altruistic behaviour that arises as a result of cognition and can be explained by the: *negative state relief model and the empathy altruism model* (Schaller and

Cialdini 1988 and Batson 1981).

These theories are outlined briefly below:

Biology - Altruism Theories:

Kin Selection Theory forecasts that the degree of altruism displayed depends on genetic affinity as represented by *The Selfish Gene Theory* which suggests that there is an innate determination for the survival of one's genes (Dawkins 1976).

Reciprocal Altruism Theory explains why people perform altruistically when they are not genetically associated. For example, it may benefit an animal to behave altruistically if there's an expectation that the favour will be repaid at some point in the future (Trivers 1971).

Reciprocal Altruism: The Prisoner's Dilemma Axelrod and Hamilton (1981) found that a 'tit for tat' strategy used in this game established cooperative behaviour. They argue that this kind of cooperation is evolutionarily adaptive.

Psychology - Altruism Theories:

The Empathy-Altruism Model has been put forward by the social psychologist Daniel Batson who disagrees with the idea that we only help others to alleviate negative feelings. According to Batson, the empathy-altruism hypothesis involves:

feeling empathy for [a] person in need evokes motivation to help [that person] in which these benefits to self are not the ultimate goal of helping; they are unintended consequences" (Batson and Shaw 1991, p.114).

He denotes altruism as a *motivational* state with the ultimate goal being to increase another's welfare. In other words, if you feel empathy towards a person, you will help, regardless of what you may gain from it (Batson and Shaw 1991). He suggests that people experience two kinds of emotion when they see suffering: Personal distress (e.g. anxiety, fear) and Empathic Concern (e.g. sympathy, compassion, tenderness) (Batson et al. 1981).

For Batson the source of altruistic motivation is *empathic concern* which he defines as:

other-oriented emotion elicited by and congruent with the perceived welfare of someone in need (Batson 2010, p.11)

Other-oriented emotional responses involve feeling for the other. The empathy-altruism hypothesis therefore claims that empathic concern felt for a person in need produces altruistic motivation to relieve that need (Batson and Shaw 1991, Batson et al. 2009).

Negative-State Relief Model This model purports that we help others in order to alleviate the stress/distress we feel when facing a bad state of someone in need. This model also explains why people walk away. Walking away also relieves distress. This model does clarify some behaviour, however feelings of distress do not always lead to helping behaviour in particular situations (Schaller and Cialdini 1988).

Ethology – Empathy and Direct Altruism

Frans de Waal as an ethologist outlines three main points in his work. First he offers a comprehensive and deeper definition of empathy outlined below; second he presents a description of *direct altruism*. Third, he presents his hypothesis that empathy is the main proximate mechanism for direct altruism (de Waal 2008). His insights into the phenomenon of altruism in particular will provide potential explanation for some of the results from our experimental data.

He outlines two different approaches for defining empathy: the top-down and bottom-up approaches. With the top-down approach empathy is seen as to *Put yourself in another shoes*, but that definition disconnects empathy from its possible antecedents. De Waal put forward a bottom-up approach which refers to the:

perception of the emotional state of another automatically activating shared representations which result in a matching emotional state in the observer. With increasing cognition, state-matching evolved into more complex forms, including concern for the other and perspective taking (de Waal 2008, p.282)

This bottom up approach therefore describes three levels of empathy as observed in both animals and humans, and may be summarized as follows:

Emotional contagion is the adoption of another's emotional state. For instance, a mother can become distressed by her offspring's distress reassuring both herself and her offspring through nursing them. Thus simple empathic reactions may benefit both individuals involved in a close interaction (de Waal 2008).

Sympathetic concern is the concern about another's state with attempts to ameliorate this state. For example, in non-human primates, the most common empathy-based concerns for another are: defense against aggression and consolation. (de Waal 2008).

Empathic perspective taking is the emotional state attributed to the other instead of oneself. For instance, dolphins support sick companions near to the surface to keep them from drowning (de Waal 2008).

According to (de Waal 2008) *direct altruism* is helping or comforting behavior directed at an individual in need, pain, or distress. He distinguishes three mechanisms that drive the altruistic impulse:

First, there is the *spontaneous altruistic impulse* witnessed in disinterested helping and caring in reaction to begging or distress signals or the sight of another in pain or need.

Second, there is *learned altruism* seen in helping as a conditioned response reinforced by the positive outcomes for the actor.

Finally, there is *intentional altruism* which is seen as help based on the prediction of behavioral effects. Help in this instance is based on an appreciation of how the actor's behavior seeks to benefit or help the other. Another possible prediction would be that help will be reciprocated, hence the act would produce a net benefit for the actor. (de Waal 2008 p.281).

With these explanations of empathy and direct altruism we are in a position to answer de

Waal's question: *Does empathy channel direct altruism?*

Empathy profiles to be a good candidate to explain direct altruism, but of course we know that not all altruistic acts are produced by empathy. Reciprocal altruism in animals has been studied (Trivers 1971; Clements and Stephens 1995; Dugatkin 1988; Dugatkin et al. 1992).

Studies show that under certain circumstances, many animal community members reduce their reproductive capacity to offer an advantage to the group as in the case of sterile insects. The typical example is the case of many birds and mammals (Wynne-Edwards 1962).

De Waal claims that for there to be direct altruism other-orientation to emotional activation is necessary. For example, in a zoo:

Chimpanzees in general are extreme hydrophobia they cannot swim and, unless they are rescued, will drown if they fall into deep water. Despite this, individuals have sometimes made heroic efforts to save companions from drowning. [...] One adult male lost his life as he tried to rescue a small infant whose incompetent mother had allowed it to fall into water. [...] To explain such behavior on the basis of expected return-benefits makes a huge cognitive leap by injecting ultimate goals into proximate decision-making. [...] It is hard to imagine that the chimpanzee's extreme hydrophobia could be overcome by a cognitive gamble on future returns. A male who jumps in the water must have an overwhelming immediate motivation, which probably only emotional engagement can produce (de Waal 2008 p.289).

As we observe in this example, in the case of primates, empathy may encourage direct altruism as habitually seen in the connection of facial expressions and vocalizations of both altruists and recipients. De Waal (2008) argues that the phenomenon of empathy is the only mechanism that provides a unitary motivational explanation in a wide variety of situations in which that actor dispenses assistance according to need (de Waal 2008).

3.4 Measurement - Psychometric Instruments

One of the main methodological issues for our research has been to identify how it is possible to reliably measure empathy. This section of the literature review is drawn from recent neuroscientific literature and covers the background that has informed our selection of

psychometric instruments for measuring empathy. According to (Bernhardt and Singer 2012) in their study *The Neural Basis of Empathy* and other studies in neuroscience by (Singer at al. 2004(b), Singer 2006) technology (PET and fMRI) has been developed that can reliably detect empathy in the brain. In our experiment we incorporated psychological tests to measure individual empathic responses to gain more precise measurements.

Our literature review identified three tests for measuring empathy that were found to correlate positively with each other in our pilot and repeat surveys. They are: The Interpersonal Reactivity Index (IRI) (Davis, 1983); Empathy Quotient (EQ) (Baron-Cohen and Wheelwright 2004) and Basic Empathy Scale (BES) (Jolliffe and Farrington 2006).

In his work on the Interpersonal Reactivity Index IRI, Davis (1983) pointed out that most previous work focused only on a single aspect of empathy, either instinctive (cognitive) empathy or intellectual (emotional) empathy. He considered a good measure of empathy should provide distinct assessments of the cognitive, perspective-taking capabilities or tendencies of the individual, and the emotional reactivity of such individuals. Moreover, the instrument should be easy to administer and score. Davis's IRI test met these criteria. He developed a 28 items test, with four macro-factors of 7 items each, in order to underline different aspects of empathy.

The Empathy Quotient EQ instrument developed by (Baron-Cohen and Wheelwright, 2004) to capture the expected results both in a clinical and in a general adult sample has proved to be a reliable test instrument to measure the presence of empathy in an adult sample with some limitations identified by the authors.

The first limitation is common to every self-report method and it is the possibility of self-portraying biases, the EQ only assesses the individual's beliefs about their own empathy, or how they might like to be seen or think about themselves, and this may be different to how empathic the individual is in reality. Secondly, the empathy measure could comprise trait or state undetected components. Subjects could be more empathic because of genetic factors or previous experience. Moreover, the empathy measure depends on the current emotional state of the individual at the moment he/she completes the questionnaire (Baron-Cohen & Wheelwright, 2004).

Another important consideration related to the use of this test is that it does not make a distinction between cognitive and affective empathy. On the contrary it gives a unique value for empathy. This limitation has also been raised by other authors as well ([Reniers, Corcoran, Drake, Shryane and Völlm 2011](#)).

The authors propose an EQ instrument comprising 40 questions and 20 more control items, to test for empathy in adults who are normally educated. The responses for each item could be 2, 1 or 0, with 0 as complete disagreement and 2 as complete agreements.

The Basic Empathy Scale BES developed by [Jolliffe and Farrington \(2006\)](#) was prepared for adolescent testers aged about 15. The authors chose adolescents for two reasons. In this age group empathy differences between empathic and non-empathic individuals are sharper than for those in the adult stage; also, if the questionnaire is comprehensible and easy to complete by adolescents, it would therefore be suitable for adults to complete.

This BES questionnaire is likely to be a reliable instrument for assessing empathy in that it reliably distinguishes between the two forms of empathy: The affective component of empathy reflecting the attitude of people to share and feel another's emotions and cognitive empathy capturing empathy as synthesized in Theory of Mind (ToM) or mentalizing theories and also identified in several other studies ([Albiero et al. 2009](#), [Baldner and McGinley, 2014](#)).

4. Implications of Empathy for Economics

As we tell stories about the lives of others, we learn how to imagine what another creature might feel in response to various events. At the same time, we identify with the other creature and learn something about ourselves.

– Martha C. Nussbaum (in Harmon 2002 p.177)

In order to analyze the implications of empathy for interpersonal relations especially in the field of economics, we first need to consider the role of the emotions in economics because this approach offers insights to enable us to better comprehend empathy. Secondly we present several experiments in which subjects' level of empathy is measured in economics' games.

4.1 Emotion in Decision Making

Emotions are a fundamental component in human beings. Biologically we are shaped to “feeling” the other's emotions. We can then give an interpretation of the other's emotion.

Since the foundation of economics the role of the emotions has been essential. However neoclassical economic theory almost eliminated emotions from the analysis (Wälde 2015). But today with more detailed microeconomic analysis and the field of behavioral economics the emotions again have a role in the explanation of how people make choices when rationality alone is not sufficient to explain how people make decisions (Elster 1998).

The emotions play an important role in decision-making. There are different emotions that operate differently. For instance, research shows us that on a sunnier day people tip more in restaurants (Rind and Strohmetz 2001), fluctuations in weather affect stock returns (Hirshleifer and Shumway 2003) and influence people's decisions in buying cars and homes (Busse et al. 2015). There is a strong link between soccer outcomes, mood and the market e.g.

the market declines after soccer losses (Edmans et al. 2007).

The emotions play a predominant role in interpersonal relations. Through showing emotions people provide information about their motivations and connections to other people. According to (Singer and Fehr 2005) pursuing cooperative or competitive strategies with others depends on our beliefs about their intentions. The authors illustrate how neuroscience offers understanding of the neural channels underlying our capacity to represent others' intentions, beliefs and desires. "Our ability to empathize may have evolved from a system which represents our own internal feeling states and allows us to predict the affective outcomes of an event for ourselves and for other people" (Singer and Fehr 2005 p.342).

Their thesis is that empathy drives prosocial behavior because humans can feel empathy for others with a variety of emotions and sensations that are activated through perception. For instance, (Singer et al. 2004b) conducted an experiment with couples to test empathy for pain. In the experiment one partner receives a painful stimulation and the other partner sees the pain of his/her partner. Brain activity for both of them was measured with a fMRI. The results show activation in the area of the bilateral anterior insula (AI) which is where the empathy process is located in our brain.

They conclude that Empathy and ToM allow humans to comprehend others' beliefs, intentions, feelings and thoughts. These skills allow individuals to forecast others' behavior. Empathic people can infer others' motives and actions and in exhibiting more affective concerns for others tend to manifest altruistic behavior.

4.2 Empathy and Behavioral Economics

Artinger and colleagues (Artinger et al. 2014) attempt to answer the question whether *empathy and Theory of Mind (ToM) promote pro-social behavior*. Their conceptual framework for investigating the role of empathy in economics, derives from advances in measuring empathy in neuroeconomics and the field of ethology (Singer and Fehr 2005, de Waal 2008).

In their experiment they apply two neutrally framed games Dictator Game (DG) and Ultimatum Game (UG) in order to seek a correlation between empathy and generosity.

However, they did not achieve a significant result. Continuing the analysis, they calculated two indices: one for fairness and the other for selfishness. Their results showed that fair players have more accurate beliefs about the offers in the DG and UG compared to selfish players. But, interestingly, selfish people are more likely to exploit their ability to understand other's actions in order to play better in the UG. In particular, selfish people act more strategically and manage to capitalize on their beliefs when they have to offer an amount in the UG ([Artinger et al. 2014](#)).

One of the latest publications in the field of behavioral economics is the investigation of Grohn et.al, 2014 titled: *A note on empathy in game*. This work draws on insights from the psychological literature on empathy. They have incorporated these insights into a standard utility framework in which they try to show a possible interaction between beliefs and utility through the influence of empathy.

They present an interesting point on how empathy operates through both utility and belief formation. They focus on the following mechanisms: “imagine self” (subjects imagine their own emotions in similar circumstances to the other), “imagine other” (where a subject tries to imagine how the other is feeling) that define empathy as a process of belief formation and the “empathy altruism-hypothesis” ([Batson 2010](#)) that suggests that a particular process of belief formation triggers partial altruism.

The three mechanisms mentioned above provide an explanation of why subjects who are more sophisticated when it comes to evaluating the preferences of others are also more prone to have *other-regarding* preferences ([Grohn et al. 2014](#)). To test their model, they use three toy games employed by games theorists: The Public Good Game (PGG), the Ultimatum Game (UG) and Battle of Sexes game. They classified players into those with low empathy (L) and those with high empathy (H) ([Grohn et al. 2014](#)).

Their main findings show that only players of type H will contribute to the common pool in a PGG; that players of type H will contribute more if they are paired with another player of type H and they predict that players in the PGG who are classified as empathic also act in ways that might be characterized as “altruistic” and also exhibit reciprocal behavior ([Grohn et al. 2014](#)).

In the study of [Pelligra \(2011\)](#) titled: *Empathy, Guilt-Aversion and Patterns of Reciprocity* the author explores the interesting concept of the guilt factor which is a psychological element

in the extended utility function for other regarding-preferences. The author utilizes the guilt factor as a proxy for empathy. From a psychological perspective subjects tend to feel or anticipate the suffering and distress of others. For the author anticipating guilt is a way to empathize with the other. For instance, when there is a situation of inequality or opportunism, the guilt factor produces a cost with negative effects and in this case subjects try to anticipate and avoid by behaving prosocially.

In order to test the link between the capacity to empathize and prosocial behavior with the assumption that behavior is driven by guilt aversion Pelligra utilizes the Investment Game (see definition in the glossary) and a test of Empathy Quotient (EQ).

The experiment's results show that there is not a correlation with the amount sent by the trustor's side and (EQ) empathy score as a measurement of trust. The interesting finding is on the trustee's side, where the score for empathy is strongly associated with the patterns of restitution measured as the correlation between the amount received by the trustor and his/her amount returned. The author classifies these patterns as either conditional reciprocity or balanced reciprocity. Basically, the "balanced reciprocators" are those who give back an inferior amount. While the "conditional reciprocators" denote people who increase the payback of the amount sent from the trustor. Only highly empathic subjects that are willing to reciprocate in a conditional way are able to induce trust and contribute to laying the ground for the social benefits associated with high-trust communities.

A recent study by [Chen \(2016\)](#): *Does Empathy Beget Guile?* investigates whether empathy channels guile. He hypothesizes that because persons who are empathic are better at putting themselves in the other's shoes and knowing what the other person wants they could intentionally deceive that person. In this experiment he explores the effect of "priming" individuals in which different texts are used to induce empathy and to trigger guile ([Chen 2016](#)).

The findings show that participants primed for empathy, are less deceptive towards a third party in an economic deception game. Meanwhile participants primed for guile became less likely to perceive that deceiving others is unfair. In conclusion the experiment's results indicate that empathy does not beget guile, but remarkably, begets its opposite.

To conclude this section on the implications of empathy in economics a discussion summarizing the main research findings and questions that are still open will be presented. This discussion forms the research background for introducing the findings from the experiments conducted for this thesis and will point to further potential neuro-economics research.

5. Discussion

The aim of this section is to evaluate whether the phenomena of empathy help us to understand interpersonal relations in distinct scientific areas, but particularly in the discipline of economics.

The first part of this literature review referred to the insights of classical economist [Adam Smith \(1759\)](#) who underlined the role of sympathy in identifying with other fellow human beings and experiencing their feelings. Later Game Theory pointed us to a conscious study of strategic interactions, the role of incentives, the quantity of information, beliefs and the social knowledge between individuals in order to achieve their goals. The analysis of Theory of Mind (ToM) and Empathy are now seen to be essential in economics.

Subsequently, thanks to the development of philosophical and psychological reflection and also scientific progress in biology, neuroscience, neuroeconomics and ethology we are able to more deeply understand and to better analyse the multidimensional phenomena of empathy. The economic field has been enriched by these different scientific perspectives giving more precision to our analysis of the real drivers that underlie social and economic interactions.

The seminal discovery of *Mirror neurons* and *Perception* in the fields of neuroscience, biology and ethology are informing with more precision a multidimensional analysis. We know with more accuracy the areas of our brain that are activated when animals and human animals, are in interaction with the other. Even perception is nominated in phenomenology as a *primordial* experience involving direct co-perception of body and mind together in a present context. Phenomenology and psychology present the following two points of view: the “*imagine self*” subjects imagine their own emotions in similar circumstances to the other and

“*imagine other*” where a subject try to imagine how the other is feeling.

In Ethology, Frans de Waal presents his hypothesis that empathy is the main proximate mechanism for *Direct Altruism* and the psychologist Daniel Batson offers his theory on the *Empathy-Altruism Hypothesis*.

The implications of research into empathy for the discipline of economics derive from different hypotheses about the role of empathy in interpersonal behaviour and its impact on driving altruism, fairness, guile, guilt. (Singer and Fehr 2005, Pelligra 2011, Artinger et al. 2014, Grohn et al. 2014 and Chen 2016)

Artinger and co-authors’ main result illustrates that fair players have more accurate beliefs about the offers in the DG and UG compared to selfish players. But, interestingly, selfish people are more likely to exploit their ability to understand others’ actions in order to play better in the UG. The main conclusion from their research contrary to our finding is that they did not find any connection between empathy and prosocial behaviour.

Grohn and co-authors are the first to incorporated empathy into a standard utility framework. Pelligra shows that the effect of empathy is present in the patterns of reciprocity. Chen in his experiment using different framing to induce empathy and guile, shows that empathy does not beget guile.

In conclusion, empathy can be considered as an important mechanism that helps in understanding other emotions, feelings, intentions and beliefs and is also an important channel to induce altruism.

6. Open Questions and Rationale

We have presented a brief survey of the literature related to the concept of empathy as studied in philosophy-phenomenology, neuroscience, biology, psychology, ethology and economics. From this reading we isolated the following research questions:

First: what is the role played by empathy in strategic behavior as observed in simple economic games? (chapter 2).

Second: how empathy affects individuals’ choice in a multipersonprisoner’s dilemma (a

variant of Public Good Game) a game that is commonly used to model cooperation in social dilemmas (chapter 3).

Third: how empathy affects individuals' willingness to engage in the production of a public good in the form of responsible consumption? We test this question and explore for gender differences by using the so-called Vote-with-the-Wallet Game.

References

- Albiero, P., Matricardi, G., Speltri, D., and Toso, D. (2009). The assessment of empathy in adolescence: A contribution to the Italian validation of the 'Basic Empathy Scale'. *Journal of Adolescence*, 32(2), 393–408.
- Aristotle, (1999). *Politics*, (trans. Benjamin Jowett). Kitchener, Batoche Books
- Artinger, F., Exadaktylos, F., Koppel, H., Sääksvuori, L. (2014). In Other's Shoes: Do Individual Differences in Empathy and Theory of Mind Shape Social Preferences? *PLoS ONE*, 9 (4).
- Aumann, R. (1976). Agreeing to Disagree *The Annals of Statistics*, 6(4), 1236-1239.
- Axelrod, R., & Hamilton, W. (1981). The Naked Emperor: Seeking a more plausible Genetic Basis for Psychological Altruism. *Science*, 211, 1390-1396.
- Baldner, C., & McGinley, J. (2014). Correlational and Exploratory Factor Analyses (EFA) of Commonly Used Empathy Questionnaires: New insights. *Motivation and Emotion*, 38(5), 727-744.
- Baron-Cohen, S., and Wheelwright, S. (2004). The Empathy Quotient: An Investigation of Adults with Asperger Syndrome or High Functioning Autism, and Normal Sex Differences. *Journal of Autism and Developmental Disorders*, 34(2), 163-175.
- Batson, C., Duncan, B., Ackerman, P., Buckley, T., & Birch, K. (1981). Is Empathic Emotion a Source of Altruistic Motivation? *Journal of Personality and Social Psychology*, 40(2), 290.
- Batson, C., & Shaw, L. (1991). Evidence for Altruism: Toward a Pluralism of Prosocial Motives. *Psychological Inquiry*, 2(2), 107-122.
- Batson, C. D., Ahmad, N., and Lishner, D. (2009). Empathy and Altruism. *Handbook of Positive Psychology*, Oxford 417.
- Batson, D. (2010). Empathy-Induced Altruistic Motivation. In M. Mikulincer and P. R. Shaver (Eds.), *Prosocial Motives, Emotions and Behavior: The Better Angels of Our Nature* Washington, D.C.: American Psychological Association 15–34.
- Bernhardt, B. C., & Singer, T. (2012). The Neural Basis of Empathy. *Neuroscience*, 35(1)
- Binmore, K. (1994). *Game Theory And The Social Contract: Playing Fair*, MIT Press, Cambridge, Mass.

- Busse, M. R., Pope, D. G., Pope, J. C., and Silva-Risso, J. (2015). The Psychological Effect of Weather on Car Purchases. *The Quarterly Journal of Economics*, 130(1), 371-414
- Chen, D. L. (2016). Does Empathy Beget Guile? Experimental Evidence Working Paper *Institute for Advanced Study in Toulouse (IAST)* (16-42)
- Clements KC, Stephens DW (1995). Testing Models of Non-Kin Cooperation: Mutualism and The Prisoner's Dilemma *Animal Behavior* 50, 527-535.
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44(1), 113-126
- Dawkins, R. (1976). *The Selfish Gene*, Oxford University Press. New York.
- De Waal, F.B.M (2000). Attitudinal Reciprocity In Food Sharing Among Brown Capuchin Monkeys. *Animal Behavior*, 60 253–261
- De Waal, F. B. (2008). Putting the altruism back into altruism: the evolution of empathy. *Annual Review of Psychology*, 59(1), 279–300
- De Waal, F. (2016). *Are We Smart Enough to Know how Smart Animals Are?*. WW Norton & Company. New York. 352
- Dugatkin LA (1988). Do Guppies Play Tit For Tat During Predator Inspection Visits? *Behavioral Ecology and Sociobiology* 25, 395–399
- Dugatkin LA., Mesterton-Gibbons M., Houston AI., (1992). Beyond The Prisoner's Dilemma: Towards Models to Discriminate Among Mechanisms of Cooperation In Nature. *Trends in Ecology and Evolution*, 7, 202–205
- Edmans A., Garcia D., Norli Ø. (2007). Sports Sentiment and Stock Returns. *The Journal of Finance* 62: 1967-98.
- Elster, J. (1998). Emotions and Economic Theory. *Journal of Economic Literature*, 36(1).
- Fehr E., Camerer C., (2007). Social Neuroeconomics: The Neural Circuitry of Social Preferences. *Trends in Cognitive Sciences*, 11(10), 419-427
- Gallese, V. (2006). Intentional attunement: A neurophysiological perspective on social cognition and its disruption in autism. *Brain Research Cognitive Brain Research*, 1079.
- Grohn, J., Huck, S., & Valasek, J. M. (2014) A note on empathy in games. *Journal of Economic Behavior & Organization*, 108, 383-388.
- Gurmin, J. H. (2007). Edith Stein and Tania Singer: A Comparison of Phenomenological and Neurological Approaches to The Problem of Empathy'. *Maynooth Philosophical Papers*, (4), 99-122.

- Harmon, J. L. (2002). *Take My Advice: Letters to the Next Generation from People who Know a Thing Or Two*. Simon and Schuster. New York.
- Hirshleifer D, Shumway T. (2003). Good Day Sunshine: Stock Returns and The Weather. *The Journal of Finance* 58: 1009-32.
- Jolliffe, D., & Farrington, D. P. (2006). Development and Validation of the Basic Empathy Scale. *Journal of Adolescence*, 29(4), 589-611.
- Kirman, A., Teschl, M. (2010). Selfish or selfless? The role of empathy in economics. *Philosophical Transactions of the Royal Society - B*, 356, 303-317.
- Lewis, D. K. (1969). *Convention: A Philosophical Study*. Cambridge, MA: Harvard University Press.
- Liddell H. S. R. (1940). *A Greek-English Lexicon*. Oxford. Clarendon Press.
- McDaniel, Kris (2016). Edith Stein: On the Problem of Empathy. In Eric Schliesser (ed.), *Ten Neglected Philosophical Classics*. Oxford
- Mill, J. S.(1874) On the Definition of Political Economy, and on the Method of Investigation Proper to It," *Essays on Some Unsettled Questions of Political Economy*, London: Longmans, Green, Reader & Dyer, 1874, 5,38-48.
- Meneses, R. W., & Larkin, M. (2012). Edith Stein and The Contemporary Psychological Study of Empathy. *Journal of Phenomenological Psychology*, 43(2), 151-184.
- Pelligra, V. (2011). Empathy, Guilt-Aversion, and Patterns of Reciprocity. *Journal of Neuroscience, Psychology and Economics*, 4 (3), 161-173.
- Premack, D. G.; Woodruff, G. (1978). Does The Chimpanzee Have a Theory of Mind? *Behavioral and Brain Sciences*. 1 (4): 515–526.
- Preston, S. D., & De Waal, F. B. (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, 25(1), 1-20.
- Rabin, M. (1993). Incorporating Fairness into Game Theory and Economics, *American*
- Reniers, R. L., Corcoran, R., Drake, R., Shryane, N. M., & Völlm, B. A. (2011). The QCAE: A Questionnaire of Cognitive and Affective Empathy. *Journal of Personality Assessment*, 93(1), 84-95.
- Rind, B., & Strohmets, D. (2001). Effect of Beliefs About Future Weather Conditions on Restaurant Tipping. *Journal of Applied Social Psychology*, 31(10), 2160-2164.

Rizzolatti G, Fadiga L, Gallese V, Fogassi L (1996) Premotor Cortex and The Recognition of Motor Actions, *Cognitive Brain Research* (3) 131-141

Schaller, M., & Cialdini, R. B. (1988). The Economics of Empathic Helping: Support for a Mood Management Motive. *Journal of Experimental Social Psychology*, 24(2), 163-181.

Smith, A. (1759/1976). *The Theory of Moral Sentiments*, Oxford: Oxford University Press.

Smith, David Woodruff, "Phenomenology", *The Stanford Encyclopedia of Philosophy* (Winter 2013 Edition), Edward N. Zalta (ed.)

URL=<http://plato.stanford.edu/archives/win2013/entries/phenomenology/>

Singer, T., Seymour, B., O'doherty, J., Kaube, H., Dolan, R. J., & Frith, C. D. (2004b). Empathy for Pain Involves the Affective but not Sensory Components of Pain. *Science*, 303(5661), 1157-1162.

Singer, T. and Fehr, E. (2005). The Neuroeconomics of Mind Reading and Empathy. *American Economic Review*. 95, 340–345.

Singer, T. (2006). The Neuronal Basis and Ontogeny of Empathy and Mind Reading: Review of Literature and Implications for Future Research. *Neuroscience & Biobehavioral Reviews*, 30(6).

Singer, T., and Lamm, C. (2009). The Social Neuroscience of Empathy. *Annals of the New York Academy of Sciences*, 1156(1), 81-96.

Stein E. (1917). On the Problem of Empathy: The Collected Works of Edith Stein, vol. 3 *ICS Publications*, 1989 Washington D.C. (Traduzioni: Il problema dell'empatia, a cura di Elio Constantini e Erika Schulze Constantini, Roma 1985).

Titchener E.B. (2014). Introspection and Empathy Dialogues in Philosophy, *Mental and Neuro Sciences*. 7, 25–30.

Trivers RL (1971). The Evolution of Reciprocal Altruism. *The Quarterly Review of Biology*. 46(1), 35-57

Wälde, K., (2016). Emotion Research in Economics," *Working Papers 1611, Gutenberg School of Management and Economics*, Johannes Gutenberg-Universität Mainz.

Whitman, W., Bradley, S., & Blodgett, H. W. (2008). *Leaves of Grass: A Textual Variorum of the Printed Poems*, NYU Press. 1855-1856.

Wynne-Edwards, V.C. (1972). *Animal Dispersion in Relation to Social Behavior*. Edinburg, Oliver & Boyd.

Chapter 2

Empathy and Strategic Behavior in Simple Experimental Games

ABSTRACT: The ability to empathize is a fundamental social competence. In strategic interactions, the ability to understand and to share others' emotional states is crucial in ascribing intentions, in anticipating others' choices and in best replying to them. Despite this important role for understanding interpersonal behaviour, economists and game theorists have devoted little attention to how empathy interacts with preferences, beliefs and choices. In this paper we present the results of a laboratory experiment designed to investigate whether and how heterogeneity in individuals' empathic abilities affects observed differences in their behaviour in a variety of iconic economic games. We find that, in general, empathy does not affect strategic behaviour in situations such as the Ultimatum Game (UG) and the Prisoner's Dilemma game (PD), but has a clear and positive impact on altruism, as measured by offers in the Dictator Game (DG) and a negative effect on investment in the Trust Game (TG). We also find a significant trade-off between empathy and depth of strategic thinking, mainly associated with gender differences in these games.

Keywords: Empathy, Social Preferences, Lab Experiment.

JEL Code: C92, C72, D03.

1. Introduction

The ability to understand others' mental states (beliefs, goals, intentions and emotions) is probably the most fundamental social competence of human beings. Our normal interactions with others strongly depend on this function; A deep access to others' internal states is important both in terms of self-interested and other-regarding behavior. Being able to anticipate our mate's intentions, in fact, gives us the possibility to optimize our choices in order to maximize our own payoff. At the same time, the ability to share their positive and negative emotions and to be affected by them, makes us more sensitive to the pain and the joy of those we interact with, and therefore provide us with additional motivations to promote their well-being. There is a certain amount of psychological evidence that lends support to this link between empathy and pro-social behavior ([Eisenberg et al. 2010](#); [Penner et al. 2005](#) and [Coke et al. 1978](#); [Dovidio et al. 1990](#); see also [Krebs, 1975](#); [Batson, 2011](#) and [Eisenberg and Miller 1987](#), for reviews).

Despite its importance, the concept of empathy has received very little attention by economists. Notable exceptions are [Singer and Fehr \(2005\)](#); [Kirman and Teschl \(2010\)](#); [Pelligra \(2011\)](#); [Grohn et al. \(2014\)](#) and [Artinger et al. \(2014\)](#). A common idea coming from their work is that empathy has an impact on individuals' ability to think strategically and on their disposition to act pro-socially. [Singer and Fehr \(2005\)](#), in particular, advance two distinct 'testable hypotheses': people with higher empathy are i) better predictors of other's motives and actions and ii) they are likely to display altruistic behaviour.

In this paper we present the results of an experiment designed to explore the link between empathy and strategic thinking, on the one hand, and pro-social behavior, on the other. We do this by correlating participants' behavior in a variety of simple experimental games with their level of empathy, as measured by different psychometric instruments. We find a clear positive impact of empathy on individuals' willingness to give in a Dictator Game, and a negative impact on participants' willingness to trust in a Trust Game. Otherwise, empathy seems not to be correlated with any systematic differences in other games that imply strategic thinking, with one notable exception. We find, in fact, a strong negative correlation between empathy and depth of strategic thinking as measured in the guessing game; however that result appears to be driven ultimately by the gender difference we find in the distribution of the empathy measures.

The remainder of this paper is organized as follows: Section 2 presents a definition of empathy, and discussion of some of the hypotheses about its role in explaining strategic behavior. Section 3

describes the experimental design, hypotheses and procedures. Section 4 discusses the results and Section 5 draws conclusions.

2. Empathy, Strategic Thinking and Pro-Social Behavior

In the middle of the 18th century [Adam Smith \(1759 \[1976\]\)](#), influenced by the work of the philosopher [David Hume \(1751\)](#), was the first to introduce the notions of sympathy or, in modern terminology, empathy, into the economic discourse. In his *Theory of Moral Sentiments* (1759 [1976]), Smith considers empathy as the source of the link that we, by nature, experience with the other human beings: “As we have no immediate experience of what other men feel, we can form no idea of the manner in which they are affected, but by conceiving what we ourselves should feel like in the situation (...) By the imagination we place ourselves in his situation, we conceive ourselves enduring all the same torments (...) and become in some measure the same person with him” (p. 9). He continues: “Of this kind is (...) the emotion which we feel for the misery of others, when we either see it, or are made to conceive it in a very lively manner. That we often derive sorrow from the sorrow of others is a matter of fact too obvious to require any instances to prove it” (p. 9). Smith, pushing further Hume’s argument suggests that not only are we capable of seeing the world from the others’ perspective, but that we can see the world as it is seen by others: “When I condole with you for the loss of your son, in order to enter into your grief, I do not consider what I, a person of such a character and profession, should suffer, if I had a son, and if that son was unfortunately to die; but I consider what I should suffer if I was really you, and I not only change my circumstances with you, but I change persons and characters” (p. 317). Smith suggests that by empathizing with another individual we simulate in our brain the situation the other is living in, in the most genuine fashion. We can understand the emotional states of others by reproducing them, offline, in our own brain. It is no difficulty to realize how a detailed comprehension of this ability can be crucial to grasp the dynamics of our social interactions.

Despite the centrality given to the notion of empathy by the founding father of economic science, for almost two hundred years, the notion was put aside by the profession, only to be resurrected recently especially thanks to the reinvigorated dialogue between economics, psychology and the neurosciences. Among psychologists ([Hoffman M., 1977](#); [Eisenberg and Strayer, 1987](#); [Batson, 2011](#); [Preston and Hofelich, 2011](#)), philosophers ([Stein, 1917](#); [Coplan and Goldie, 2011](#)), and neuroscientists ([Rizzolatti et al. 1996](#); [Gallese, 2001, 2003](#); [Gazzaniga, 2008](#); [Decety and](#)

Ickes, 2009; Bernhardt and Singer, 2012), empathy has been defined in many different ways; here we adopt the definition advanced by an ethologist, Frans de Waal (2008) who has embedded the exploration of the functioning of empathy in a rich comparative framework.

According to de Waal, (2008): “Empathy allows one to quickly and automatically relate to the emotional states of others, which is essential for the regulation of social interactions, coordinated activity, and cooperation toward shared goals” (p. 282). He defines the concept as the capacity to:

- a) be affected by and share the emotional state of another;
- b) assess the reasons for the other’s state.
- c) identify with the other adopting his or her perspective (de Waal, 2008, p. 281).

This definition has the virtue to clearly distinguish empathy from the closely related concept of ‘theory of mind’ (ToM). The ability of mentalize, or having a ToM, in fact, is the ability to think about other individuals’ thoughts, that is, to *understand* their mental states (beliefs, desires, goals and intentions), while empathy refers to the ability, not only to understand other’s thoughts but to *share* their emotional states: to feel pain with those who feel pain but also to feel joy, regret and guilt, with others who feel joyful, regretful and guilty. The two concepts are somehow intertwined because one needs ToM to be able to put oneself in someone else’s shoes; however, empathizing means not only taking the other’s perspective but also sharing the other’s emotional states. That is why ToM is a sufficient but not necessary condition to be able to empathize. The two concepts differ because of the affective dimension implied by empathy and not by ToM.

Coming to economics, Kirman and Teschl (2010) indicate three key issues in which the explicit introduction of the concept may help: game theory, and in particular the clarification of its core assumption of ‘common knowledge’; the much-debated problem of the interpersonal utility comparison in welfare economics and, finally, the study of social preferences and other-regarding orientation in behavioral economics. Game theory and social preferences are considered also by Singer and Fehr (2005) as a field in which the introduction of the idea of empathy may bring fruitful insights. They point out that “the most fundamental solution concepts in Game Theory – Nash equilibrium, backward induction, and iterated elimination of dominated strategies – are based on the assumption that people are capable of predicting others’ actions” (p. 340) and therefore they are intimately connected to empathy, insofar as being able to empathize allows individual to better predict other individuals’ behavior. They consider, as an example, a sequential PD game. The attempt to predict whether the partner will cooperate or defect after a cooperative choice relies on

the first mover's belief about the partner's type but also about her ability to understand the partner's actual feeling and emotional state. Expecting cooperation after defection, in fact, is not the same as expecting cooperation after cooperation. "Your capacity to empathize, that is, to simulate the internal state resulting from being cheated in a social exchange will help you to predict the opponent's likely action" (p. 343). According to this argument, thus, empathy may help the decision-maker to best reply in order to get the highest benefit to herself. In this sense empathy promotes self-interest. However, at the same time, for similar reasons, empathy may induce other-regarding behaviors. Being aware of the costs that our action may impose on others, and being able to share the negative emotions coming from those costs, we may be willing to refrain from that very action. Not repaying your trust produces a negative sense of betrayal, with an associated feeling of regret. If I am able to anticipate and feel the same emotions, I may be willing to refrain from betraying in order to avoid the negative emotions that my action may cause. By generalizing this argument Singer and Fehr conclude suggesting that the heterogeneity in the individuals' level of empathy across the population could explain the heterogeneity of choices observed in many experimental games.

Grohn et al. (2014) agree with Singer and Fehr about the possibility that higher empathy may induce more pro-social behavior. They start from Batson's (2011) 'empathy-altruism hypothesis', and they develop a model in which agents who are more sophisticated when it comes to evaluating the preferences of others are also more prone to have 'other-regarding' preferences. In their framework, the agent's altruistic orientations are enhanced by a better knowledge, mediated by empathy, of others' beliefs and well-being that, in turn, we may affect with our choices. Generalizing the same line of reasoning, we may find a rationale for the working of empathy in many other models of social preferences. Inequality aversion models (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000), for instance, consider agents who experience a psychological cost from being in an unequal, both advantageous and disadvantageous, distribution of wealth. It is not difficult to speculate that the different subjective sensitivities to inequality may depend on the ability to anticipate and share others' distress from being treated unfairly. The same could be true both for reciprocity models (Rabin, 1993; Falk and Fischbacher, 2006; Dufwenberg and Kirchsteiger, 2004) and models of guilt aversion (Dufwenberg, 2002; Battigalli and Dufwenberg, 2007; Pelligra, 2011) where such sensitivity parameters are present.

Summarizing we can affirm that a careful reading of the psychological and neuroscientific literature and even a few formal models, suggests a possible implication of the concept of empathy in the explanation of strategic thinking and pro-social behavior.

In the next sections we shall discuss the design and the results of an experiment specifically designed to explore the impact of heterogeneity in people’s level of empathy in explaining their different patterns of behavior in a number of widely used iconic experimental games.

3. Experimental Design and Hypotheses

We consider a number of simple experimental games widely used to explore different aspects of participants’ interactive decision-making and their correlation with level of empathy. Our subjects play a sequence comprised of: Dictator Game (DG), Ultimatum Game (UG), Trust Game (TG), Prisoner’s Dilemma (PD), Guessing Game (GG). (*For more detailed explanation of each game go to Glossary pag 106*). Tables A and B show the payoff structure and the parameterization of the games.

Table A. Games Parametrization of DG, UG, TG and GG

	Endowment Role A	Endowment Role B	Efficiency rate	A->B	B->A	Strategy Method
Dictator Game	100 ECU	0 ECU	---	0-100 ECU (steps of 10)	---	No
Ultimatum Game	100 ECU	0 ECU	---	0-100 ECU (steps of 10)	[0-100] ECU Accept/Reject (steps of 10)	Yes
Trust Game	100 ECU	0 ECU	x3	0-50 ECU (steps of 10)	[0-100] ECU (steps of 10)	Yes
Guessing Game	In each session the group have to guess a number between 0 and 100, the target number is 2/3 of the average.					

Table B. Parametrization of the game: Prisoner’s Dilemma

In the Prisoner’s Dilemma, Player A has to decide whether cooperate or defect, given the following pattern of payoffs (the first amount always refers to Player A’s payoff, the second to Player B’s one, for each possible combination of choices):

		Player B	
		Cooperate	Defect
Player A	Cooperate	60; 60	30;90
	Defect	90; 30	40;40

3.1 Hypotheses

Fehr and Singer’s (2005) discussion about mind-reading and empathizing ends with the suggestion of two distinct routes for investigation: one according to which “people with stronger empathic abilities are better predictors of others’ motives and actions” (p. 323), and a second that assumes that “the very ability to empathize may also undermine purely self-interested choices and may promote other-regarding behavior” (ibid.). Following these two routes, the experimental games we consider allow us to test the following general hypotheses:

General Hypoteses: Higher levels of empathy are associated with

H1: Higher offers in the Dictator Game

H2: Higher proposals in the Ultimatum Game

H3: Lower average Minimum Acceptable Offers (MAO) in the Ultimatum Game

H4: Larger investments in the Trust Game

H5: Larger pay-backs in the Trust Game

H6: Higher rates of cooperation in the Prisoner’s Dilemma

H7: Better guesses (closer to the winning number) in the Guessing Game.

3.2 Procedures

We conducted six sessions that involved a total of 134 (77 female and 57 male)

undergraduate students from the University of Cologne. The participants were recruited via the online recruitment system ORSEE (Greiner, 2004) and the experiment was programmed using the Bonn Experiment System (Seithe, 2012). Participants were randomly assigned to a computer, where they read the instructions, responded to the control questions, played the games and filled in the empathy and the socio-demographic questionnaires.

A double blind anonymity procedure (subject vs subject and subject vs experimenters) was maintained during and after the experiment both about the participants' decisions and the payments. The subjects received 2.50 Euros as show-up fee and got an average payment of 10 Euros for a 45 minute lab session. The exchange rate between ECU and Euros was 6 ECU=1 Euro.

To measure the individuals' level of empathy we used different instruments: the Interpersonal Reactivity Index (IRI, Davis, 1983), the Empathy Quotient (EQ, Baron-Cohen and Wheelwright, 2004) and the Basic Empathy Scale (BES, Jolliffe and Farrington, 2006). We also assessed the participants' attitude towards risk through the Holt and Laury Task (HL, Holt and Laury, 2002). We also measured participants' strategic IQ using the Guessing Game and Coricelli and Nagel's (2009) procedures. Finally, we gathered some socio-demographic information for the participants by using a standard questionnaire.

4. Results

First we present the descriptive data for each game played by the participants in the experiment and the results of the empathy tests applied, and then test our hypotheses. Table 1 shows the mean of the proportional offers (DG, UG-A, TG-A), proportion of defections (PD), proportion of rejections (UG-B), amount returned (TG-B) and guessed number (GG). By using the non-parametric Wilconxon-Mann-Whitney test we check whether any differences in the distribution between genders exist.

Table 1: Summary Statistics by Games and Mean Differences by Gender

	Interval/Action	Mean	Mean Female	Mean Male	p-value
Dictator Game	(0-100 ECU)	29.291	32.233	25.315	0.1378
	(proposer's split)	(21.57)	(20.37)	(22.68)	
Ultimatum Game	(0-100 ECU)	37.985	36.883	39.473	0.273
	Proposer (sent A proposer)	(12)	(12.59)	(11.08)	
Ultimatum Game	(0=Accept) (1= Refuse)	0.278	0.263	0.3	0.107

Responder		(0.14)	(0.13)	(0.156)	
Trust Game Trustor	(0-50 ECU)	22.462 (16.38)	18.013 (13.60)	27.543 (18.44)	0.0085***
Trust Game Trustee	(0-150 ECU)	23.059	22.922 13.22	23.245 (14.10)	0.842
Prisoner Dilemma	(0=coop) (1=defect) (defectors' mean)	0.597 (0.49)	0.584 (0.49)	0.614 (0.49)	0.944
Guessing Game	To guess 2/3 of the average	42.447 (22.75)	46.610 (22.19)	36.824 (22.49)	0.0058***
N		134	77	57	

Standard errors in parentheses and p-value: *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 2 presents the descriptive statistics of the total score obtained from our three measures of empathy and means differences by gender (using the t-test we observe that the scores are statistically significant at 1%). Table 2.1 shows the average by each Empathy Score computed by dividing by the total number of questions by each test: IRI (28), BES (20) and EQ (40), and the differences by gender; (the table displays the mean difference by gender using the t-test we observe that this difference is statistically significant at 1%).

Table 2: Summary Statistics by Empathy Test Total and by Gender

	Total n=134	Men n=57	Women n=77	p-value
IRI	94.78 (9.74)	89.77 (8.83)	98.49 (8.70)	0.000
BES	75.81 (9.03)	70.59 (8.51)	79.67 (7.34)	0.000
EQ	38.64 (9.5)	34.98 (7.65)	41.35 (9.86)	0.000

Standard errors in parentheses

Table 2.1: Average by Empathy Score (IRI, BES and EQ) Total and by Gender

	Total n=134	Men n=57	Women n=77	p-value
Average IRI	3.38 (0.34)	3.20 (0.31)	3.38 (0.31)	0.000
Average BES	3.79 (0.45)	3.52 (0.42)	3.98 (0.36)	0.000
Average EQ	0.96 (0.23)	0.87 (0.19)	1.03 (0.24)	0.000

Standard errors in parentheses

Table 3 shows the correlations between the total score of our three measures of empathy (EQ, BES and IRI) and their respective subscales; for BES: cognitive empathy (BES_ce) and affective empathy (BES_ae); for IRI: fantasy (IRI_fant), perspective taking (IRI_pt), empathic concern (IRI_ec) and personal distress (IRI_pd).

We are interested in such correlations in order to understand whether the levels of empathy captured by the three tests can be compared: the highest correlation was found between BES and EQ (0.675), while BES and IRI were correlated at (0.647) and IRI and EQ at (0.574). In all the three cases, however, we found a strong positive correlation that allows us to say that these tests were actually capturing the same aspects of empathy.

Table 3: Empathy Scores and Subscales Measures Correlation

	bes_tot	bes_ce	bes_ae	iri_tot	iri_fant	iri_pt	iri_ec	iri_pd	eq_tot
bes_tot	1								
bes_ce	0.805*	1							
bes_ae	0.923*	0.515*	1						
iri_tot	0.648*	0.442*	0.650*	1					
iri_fant	0.517*	0.376*	0.503*	0.748*	1				
iri_pt	0.313*	0.453*	0.158*	0.448*	0.135	1			
iri_ec	0.609*	0.490*	0.562*	0.763*	0.446*	0.364*	1		
iri_pd	0.098	-0.226*	0.288*	0.398*	0.102	-0.284*	0.033	1	
eq_tot	0.675*	0.700*	0.521*	0.574*	0.406*	0.540*	0.661*	-0.185	1

Spearman's correlations among empathy tests and subscales (starred values are significant at 95%)

We also controlled for correlations between the subscales of BES and two of the subscales of IRI that should capture the same aspect of empathy: Perspective Taking (considered similar to the BES Cognitive Empathy) and Empathic Concern (associated to Affective Empathy in BES). Surprisingly, BES' CE is slightly more correlated with IRI's EC (0.49) than it is with IRI'sPT (0.45), while BES' AE is also positively correlated with IRI's EC (0.56).

In table 4 we present the Empathy tests and their respective subscales as well as Cronbach's Alpha (the measure of reliability of the scale items) and Mann-Whitney-Wilcoxon tests that allow us to check for differences in the distribution of unpaired observations (and assess, in our case, differences between males and females).

The results in the first column (Cronbach's Alpha) show that all the subscales have an internal validity of over 73%; the last column presents the p-values (Mann-Whitney-Wilcoxon test) for the gender differences that appear to all be statistically significant.

Table 4: Empathy Tests: Reability Scale

Subscales	Cronbach's Alpha	Mean (SD)	Mean Female	Mean Male	(p-value)
IRI-Fantasy	0.75	24.61	25.71	23.14	(0.002***)
IRI-Empathic Concern	0.74	26.15	27.2	24.73	(0.001***)
IRI-Perspective Taking	0.73	24.51	25.18	23.61	(0.039**)
IRI-Personal Distress	0.77	19.49	20.38	18.28	(0.003***)
Total-IRI	0.81	94.78	98.49	89.77	(0.000***)
BES-Cognitive Empathy	0.79	36.16	37.33	34.57	(0.000***)
BES-Affective Empathy	0.79	39.64	42.33	36.01	(0.000***)
Total-BES	0.85	75.81	79.67	70.59	(0.000***)
Total-Empathy Quotient	0.83	38.64	41.35	34.98	(0.000***)
N		134	77	57	

For each IRI subscale, a minimum of 0 or maximum of 28 score, for total IRI minimum 0 and maximum 112 score. Standard errors in parentheses and p-value: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The central part of our analysis focuses on the relationship between empathy and the choices made by the subjects in the different games.

We start discussing the first hypothesis.

Hypothesis 1: higher levels of empathy are correlated with higher offers in the Dictator Game.

The amount offered by Player A to Player B in the DG can be interpreted as a direct measure of generosity. In this game, being the recipient a passive player, there is no room for strategic considerations. DG players could offer any integer amount between 0 and 100. We conducted an OLS regression. As shown in table 5 we regressed the proposer's offer against each empathy score, the interaction term and control variables. We controlled for risk aversion, level of experience (measured as the number of previous experiments the subject participated in) and Guess Quadratic Distance (GDM), this measure is compute from guessing game.

Table 5 shows that BES and IRI test scores: (1) and (2) are associated with a positive effect that is statistically significant at 10% and 1% level respectively, meaning that more BES and IRI empathic players tend to send higher amounts to the recipients. The variable female column (4) is positive and statistically significant at 5% level, that shows that women, *per se*, give more.

Table 5: Dictator Game Amount Sent (OLS Estimates)

VARIABLES	(1) DG	(2) DG	(3) DG	(4) DG	(5) DG	(6) DG	(7) DG	(8) DG	(9) DG	(10) DG
BES_AVG	7.615*				4.562	-4.711				
	(4.249)				(4.831)	(6.850)				
IRI_AVG		17.062***					15.168**	3.062		
		(5.306)					(5.909)	(9.079)		
EQ_AVG			9.258						4.471	-19.323
			(8.002)						(8.412)	(15.030)
FEMALE				7.747**	5.762	-62.490*	3.064	-67.521*	7.032*	-24.584
				(3.838)	(4.377)	(36.359)	(4.176)	(40.635)	(4.077)	(17.108)
BES x FEMALE						0.908*				
						(0.480)				
IRI x FEMALE							0.752*			
							(0.431)			
EQ xFEMALE										0.854*
										(0.449)
EXPERIENCE	-3.474	-3.289	-3.843	-3.732	-3.538	-3.944	-3.306	-4.426	-3.741	-3.985
	(3.790)	(3.690)	(3.812)	(3.773)	(3.780)	(3.748)	(3.697)	(3.723)	(3.783)	(3.747)
AGE	0.205	0.175	0.144	0.228	0.243	0.150	0.204	0.165	0.219	0.215
	(0.298)	(0.288)	(0.298)	(0.298)	(0.298)	(0.299)	(0.292)	(0.290)	(0.299)	(0.296)
RISK	0.030	-0.013	-0.004	0.110	0.098	0.154	0.030	-0.034	0.096	0.099
	(0.500)	(0.487)	(0.504)	(0.501)	(0.502)	(0.498)	(0.492)	(0.489)	(0.503)	(0.498)
GQD	-0.002	-0.003	-0.002	-0.002	-0.002	-0.002	-0.003	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CONSTANT	-1.443	-29.265	20.126*	22.030**	5.653	40.678	-25.493	15.053	18.470*	39.356**
	(18.672)	(19.666)	(11.004)	(8.655)	(19.383)	(26.673)	(20.361)	(30.776)	(10.962)	(15.439)
OBSERV	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.040	0.074	0.026	0.046	0.053	0.079	0.093	0.114	0.048	0.075

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

In column (7) we control for IRI and female simultaneously and we observe that the coefficient for IRI-empathy score is positive and statistically significant at 5% level.

When we include the interaction term between empathy and female for BES (6), IRI (8) and EQ (10) the result is positive and statistically significant at the 10% level. This result shows that with increasing empathy scores women give higher amounts than men.

In specifications (6) and (8) the coefficients for female shows that women give less than men; the results are statistically significant at 10% level. See Appendix (experiment 1) present the results of regressions for each subscale.

Finding 1: Higher empathy in women is correlated with higher generosity in the DG.

Table 6: Ultimatum Game Amount Sent by Proposers (OLS Estimates)

VARIABLES	(1) UG-A	(2) UG-A	(3) UG-A	(4) UG-A	(5) UG-A	(6) UG-A	(7) UG-A	(8) UG-A	(9) UG-A	(10) UG-A
BES	-1.474 (2.072)				0.780 (2.310)	-1.070 (3.309)				
IRI		-2.230 (2.726)						-2.284 (4.469)		
EQ			0.983 (3.852)						4.042 (3.989)	-4.850 (7.206)
FEMALE				-4.071** (1.852)	-4.401** (2.100)	0.184 (0.235)	-4.136** (2.039)	-19.221 (20.212)	-4.701** (1.954)	-16.504** (8.216)
BES x FEMALE						-18.173 (17.734)				
IRI x FEMALE							0.229 (2.953)	0.161 (0.215)		
EQ x FEMALE										0.321 (0.217)
EXPERIENCE	3.475* (1.831)	3.494* (1.829)	3.525* (1.833)	3.531* (1.799)	3.560* (1.808)	3.458* (1.815)	3.535* (1.807)	3.279* (1.842)	3.516* (1.799)	3.385* (1.793)
AGE	0.067 (0.144)	0.075 (0.143)	0.080 (0.143)	0.034 (0.142)	0.037 (0.143)	0.019 (0.144)	0.034 (0.142)	0.027 (0.143)	0.027 (0.142)	0.027 (0.141)
RISK	0.482** (0.241)	0.489** (0.241)	0.486** (0.241)	0.432* (0.238)	0.430* (0.239)	0.442* (0.240)	0.431* (0.240)	0.417* (0.241)	0.419* (0.239)	0.421* (0.237)
GQD	0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
DG	0.278*** (0.043)	0.283*** (0.044)	0.272*** (0.042)	0.289*** (0.042)	0.288*** (0.042)	0.282*** (0.043)	0.288*** (0.043)	0.283*** (0.044)	0.287*** (0.042)	0.277*** (0.042)
CONSTANT	29.734*** (8.991)	31.326*** (9.801)	23.131*** (5.338)	27.104*** (4.215)	24.329*** (9.241)	31.445*** (12.978)	26.402*** (9.982)	34.947** (15.158)	23.931*** (5.251)	31.970*** (7.542)
OBSERV	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.286	0.287	0.283	0.309	0.310	0.313	0.309	0.312	0.315	0.327

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Hypothesis 2: In the UG higher empathy levels are correlated with larger offers.

In the UG (Table 6) we do not find any significant relationship between the amount sent by the proposer and the different empathy scores. However we find a negative effect in the amount sent for women compared to men: In specifications (4), (5), (7), (9) and (10) the coefficients for female turn out to be sizable in their sizes and statistically significant at 5% level.

Experience, risk and the amount sent in the DG are statistically significant at 10%, 5% and 1% respectively.

Finding 2: There is no effect of empathy on the amount sent in the UG.

Table 7: Minimum Acceptable Offers (MAO) in the Ultimatum Game (OLS Estimates)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	MAO	MAO	MAO	MAO	MAO	MAO	MAO	MAO	MAO	MAO
BES	0.424 (0.291)				0.339 (0.328)	0.295 (0.482)				
IRI		0.079 (0.379)					-0.127 (0.416)	-0.327 (0.636)		
EQ			0.379 (0.534)						0.203 (0.563)	0.899 (1.031)
FEMALE				0.308 (0.263)	0.167 (0.296)	-0.149 (2.542)	0.344 (0.290)	-0.844 (2.862)	0.276 (0.278)	1.195 (1.173)
BES x FEMALE						0.004 (0.034)				
IRI x FEMALE								0.013 (0.030)		
EQ x FEMALE										-0.025 (0.031)
EXPERIENCE	-0.201 (0.255)	-0.223 (0.256)	-0.224 (0.256)	-0.218 (0.255)	-0.202 (0.255)	-0.205 (0.257)	-0.220 (0.256)	-0.240 (0.261)	-0.219 (0.256)	-0.207 (0.257)
AGE	-0.030 (0.020)	-0.033* (0.020)	-0.033* (0.020)	-0.030 (0.020)	-0.029 (0.020)	-0.029 (0.020)	-0.030 (0.020)	-0.030 (0.020)	-0.030 (0.020)	-0.030 (0.020)
RISK	0.000 (0.033)	-0.000 (0.034)	-0.001 (0.034)	0.004 (0.034)	0.002 (0.034)	0.003 (0.034)	0.004 (0.034)	0.003 (0.034)	0.003 (0.034)	0.002 (0.034)
STRATEGY	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
QUOTIENT	-0.001 (0.006)	0.000 (0.006)	0.000 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.000 (0.006)	-0.001 (0.006)	-0.001 (0.006)	0.000 (0.006)
DG										
CONSTANT	6.497*** (1.264)	7.895*** (1.364)	7.809*** (0.742)	7.915*** (0.595)	6.700*** (1.318)	6.871*** (1.898)	8.301*** (1.404)	8.981*** (2.152)	7.755*** (0.744)	7.123*** (1.081)
OBSERV	132	132	132	132	132	132	132	132	132	132
R-SQUARED	0.048	0.032	0.036	0.042	0.051	0.051	0.043	0.044	0.043	0.048

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Hypothesis 3: Higher empathy is associated with lower minimum acceptable offers (MAO)

Data in the Table 7 show that there is no effect of empathy on the individuals' MAO.

Finding 3: there is no impact of empathy on MAO

Hypothesis 4: Higher empathy is associated larger investments in the TG.

In order to observe the behavior of trustors in the trust game, we conducted an OLS regression with the results shown in the next table.

Table 8: Trust Game Amount sent by Proposers (OLS Estimates)

VARIABLES	(1) TG-A	(2) TG-A	(3) TG-A	(4) TG-A	(5) TG-A	(6) TG-A	(7) TG-A	(8) TG-A	(9) TG-A	(10) TG-A
BES	-4.104 (3.241)				1.327 (3.526)	3.767 (5.053)				
IRI		-9.088** (4.217)					-3.747 (4.496)	-3.991 (6.820)		
EQ			-13.537** (5.933)						-7.795 (6.075)	-7.880 (11.069)
FEMALE				-10.043*** (2.827)	-10.605*** (3.206)	7.559 (27.085)	-8.981*** (3.104)	-10.443 (30.840)	-8.827*** (2.975)	-8.940 (12.620)
BES x FEMALE						-0.242 (0.358)				
IRI x FEMALE								0.016 (0.327)		
EQ x FEMALE										0.003 (0.333)
EXPERIENCE	2.312 (2.864)	2.318 (2.829)	2.515 (2.823)	2.468 (2.747)	2.517 (2.759)	2.651 (2.772)	2.408 (2.751)	2.383 (2.811)	2.498 (2.740)	2.497 (2.754)
AGE	-0.389* (0.225)	-0.376* (0.221)	-0.355 (0.220)	-0.467** (0.216)	-0.463** (0.218)	-0.440** (0.221)	-0.464** (0.217)	-0.465** (0.218)	-0.454** (0.216)	-0.454** (0.217)
RISK	0.605 (0.377)	0.628* (0.372)	0.633* (0.372)	0.483 (0.364)	0.480 (0.365)	0.464 (0.367)	0.502 (0.365)	0.501 (0.367)	0.509 (0.363)	0.509 (0.365)
GQD	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
DG	0.078 (0.067)	0.105 (0.068)	0.080 (0.065)	0.105 (0.064)	0.103 (0.065)	0.110* (0.066)	0.117* (0.066)	0.117* (0.067)	0.109* (0.064)	0.109* (0.065)
CONSTANT	41.220*** (14.065)	55.081*** (15.162)	37.537*** (8.221)	32.917*** (6.434)	28.198** (14.105)	18.813 (19.821)	44.389*** (15.197)	45.217* (23.128)	39.038*** (7.996)	39.114*** (11.585)
OBSERV	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.062	0.084	0.087	0.136	0.137	0.140	0.141	0.141	0.147	0.147

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

In Table 8, columns (2) and (3), show a negative relationship between empathy (IRI-EQ) and amount sent. These coefficients are statistically significant at 5% respectively (the coefficient for BES results are not statistically significant at any conventional level but are compatible in size with the other two significant coefficients).

Column (4) reports a negative effect of being female on trust intensity. This negative effect is statistically significant at 1% level. Columns (5), (7) and (9) show how females trust less than males also controlling for empathy scores (BES in 5, IRI in 7, and EQ in 9)

Finding 4: In the Trust Game, it seems that men who give higher amounts, display a trusting behavior towards the other player.

Hypothesis 5: Higher empathy is associated with larger paybacks in the TG.

In order to observe the behaviour of trustee in the trust game, we conducted an OLS regression.

Table 9 shows no statistically significant results.

Table 9: Trust Game Amount Average Returned (OLS Estimates)

VARIABLES	(1) AVG-TG-B	(2) AVG-TGB	(3) AVG-TGB	(4) AVG-TG-B	(5) AVG-TG-B	(6) AVG-TG-B	(7) AVG-TG-B	(8) AVG-TG-B	(9) AVG-TG-B	(10) AVG-TG-B
BES	0.001 (0.024)				0.009 (0.028)	0.061 (0.039)				
IRI		-0.001 (0.032)					0.007 (0.035)	0.071 (0.053)		
EQ			-0.021 (0.045)						-0.015 (0.048)	0.082 (0.086)
FEMALE				-0.012 (0.022)	-0.015 (0.025)	0.368* (0.209)	-0.014 (0.024)	0.370 (0.239)	-0.009 (0.023)	0.119 (0.099)
BES x FEMALE						-0.005* (0.003)				
IRI x FEMALE								-0.004 (0.003)		
EQ x FEMALE										-0.003 (0.003)
EXPERIENCE	-0.035 (0.022)	-0.035 (0.022)	-0.034 (0.021)	-0.035 (0.021)	-0.034 (0.022)	-0.031 (0.021)	-0.034 (0.022)	-0.028 (0.022)	-0.034 (0.022)	-0.033 (0.022)
AGE	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
RISK	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)
GQD	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
DG	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.000)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)
CONSTANT	0.120 (0.106)	0.128 (0.115)	0.144** (0.063)	0.134*** (0.050)	0.102 (0.110)	-0.097 (0.153)	0.112 (0.119)	-0.105 (0.180)	0.145** (0.063)	0.058 (0.091)
OBSERV	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.168	0.168	0.170	0.170	0.171	0.193	0.170	0.187	0.171	0.183

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

When we include the interaction term between empathy score and female dummy for BES see column (6). The respective coefficients reveal how women's contributions are decreasing in their level of empathy.

Finding 5: There is no effect of empathy with larger paybacks.

Hypothesis 6: Higher empathy levels are associated with higher levels of cooperation in the Prisoner Dilemma.

In Table 10 for the PD we conducted the following regressions but we did not find any significant result as shown. According to our hypothesis neither empathy scores nor control variables are good predictors.

Table 10: Prisoner Dilemma Rate of Defectors (OLS Estimates)

VARIABLES	(1) PD	(2) PD	(3) PD	(4) PD	(5) PD	(6) PD	(7) PD	(8) PD	(9) PD	(10) PD
BES	0.119 (0.097)				0.161 (0.110)	0.016 (0.157)				
IRI		-0.040 (0.129)					-0.038 (0.142)	-0.105 (0.215)		
EQ			-0.100 (0.181)						-0.101 (0.192)	-0.260 (0.349)
FEMALE				-0.014 (0.089)	-0.083 (0.100)	-1.164 (0.840)	-0.004 (0.098)	-0.406 (0.971)	0.001 (0.094)	-0.210 (0.398)
BES x FEMALE					0.014 (0.011)					
IRI x FEMALE							0.004 (0.010)			
EQ x FEMALE										0.006 (0.011)
EXPERIENCE	-0.054 (0.086)	-0.059 (0.086)	-0.058 (0.086)	-0.058 (0.086)	-0.052 (0.086)	-0.060 (0.086)	-0.059 (0.087)	-0.065 (0.088)	-0.058 (0.087)	-0.060 (0.087)
AGE	-0.009 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.011 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)
RISK	0.001 (0.011)	0.001 (0.011)	0.001 (0.011)	0.000 (0.011)	0.000 (0.011)	0.001 (0.011)	0.001 (0.011)	0.000 (0.012)	0.001 (0.011)	0.001 (0.012)
GQD	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
DG	-0.004** (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)
CONSTANT	0.555 (0.422)	1.148** (0.462)	1.106*** (0.251)	1.027*** (0.202)	0.453 (0.440)	1.011 (0.615)	1.144** (0.479)	1.372* (0.728)	1.106*** (0.253)	1.250*** (0.366)
OBSERV	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.067	0.056	0.058	0.056	0.072	0.084	0.056	0.058	0.058	0.060

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Finding 6: There is no effect of empathy on the rate of cooperation in the Prisoner Dilemma.

Hypothesis 7: Higher levels of empathy are associated with guesses closer to the winning number in the GG.

The Guessing Game is a appropriate game in order to understand how a player's mental processing incorporates the thinking process of others.

An individual is generally considered to be more strategic in her thinking the closer her guess is to the actual winning number, the 2/3 of the average guesses, in our setting. We consider this later

form and measure each participants' Guess Quadratic Distance (GQD) as the quadratic distance between their actual choice (x_i) in the relative session (s) and the $2/3$ of the average guesses in the same session (AG_s). The GQD is therefore defined by: $GQD=(x_{is}- 2/3 * AG_s)^2$. The higher the GQD the lower the individual's performance at guessing other players' guesses. The individual's depth of strategic reasoning (strategic IQ) is thus, inverse to the GQD score.

Table 11 shows the number of participants per session, the mean per session and the winning number per session of the Guessing Game.

Table 11: Average Guesses and Winning Numbers in The Guessing Game (per session)

Session no.	Participants per session	Mean	Winning number
Session 1	26	44.84	29.89
Session 2	24	39.13	26.09
Session 3	22	44.04	29.36
Session 4	24	41.4	27.60
Session 5	16	40.81	27.21
Session 6	22	43.95	29.30
Total	134	42.36	28.24

In Table 12 our dependent variable is the quadratic distance between the number guessed and $2/3$ on the average, the results show that the more empathic players have a high quadratic distance, therefore a lower strategic IQ. The empathy scores BES (1), (5) and IRI (2), (8) are statistically positive and significant at 5% and 10% respectively. This leads to a poor performance of the “high empathy scores type” of subjects in matching the correct guess.

Table 12: Guessing Game -Quadratic Distance (OLS Estimates)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	GG-DIS	GG-DIS	GG-DIS	GG-DIS	GG-DIS	GG-DIS	GG-DIS	GG-DIS	GG-DIS	GG-DIS
BES	471.070** (203.736)				416.906* (232.748)	415.276 (336.320)				
IRI		574.472** (269.872)					486.905 (298.674)	814.931* (450.202)		
EQ			636.402 (385.768)						496.588 (408.807)	934.601 (743.045)
FEMALE				287.585 (189.533)	104.050 (214.038)	91.917 (1,813.424)	143.643 (207.990)	2,133.301 (2,053.492)	206.803 (200.530)	790.018 (849.561)
BES x FEMALE						0.162 (23.998)				
IRI x FEMALE								-21.242 (21.811)		
EQ x FEMALE										-15.878 (22.473)
EXPERIENCE	-8.250 (183.805)	-16.541 (184.259)	-28.472 (185.473)	-26.247 (185.768)	-10.248 (184.402)	-10.338 (185.609)	-17.920 (184.647)	16.039 (187.947)	-27.839 (185.428)	-21.247 (186.029)
AGE	5.772 (14.411)	3.209 (14.370)	1.887 (14.457)	5.116 (14.633)	6.488 (14.529)	6.473 (14.763)	4.612 (14.543)	5.532 (14.576)	4.197 (14.626)	4.153 (14.655)
RISK	5.046 (24.186)	2.972 (24.257)	2.952 (24.426)	7.540 (24.587)	6.268 (24.388)	6.278 (24.535)	4.983 (24.480)	6.730 (24.551)	5.851 (24.581)	5.721 (24.631)
DG	-5.419 (4.245)	-6.446 (4.363)	-4.695 (4.264)	-5.142 (4.312)	-5.652 (4.285)	-5.657 (4.363)	-6.620 (4.379)	-5.903 (4.441)	-5.329 (4.307)	-4.790 (4.382)
CONSTANT	-1,079.888 (897.454)	-1,131.050 (982.340)	186.564 (539.995)	546.040 (432.477)	-950.109 (938.898)	-943.840 (1,324.436)	-955.800 (1,016.536)	-2,076.358 (1,535.432)	149.859 (541.033)	-248.536 (782.194)
OBSERV	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.047	0.041	0.028	0.025	0.049	0.049	0.045	0.052	0.036	0.040

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

In table 13 the coefficients of the empathy scores in columns: BES (1), (5), IRI (2) and EQ (3), (9),(10) are positive and statistically significant at 1%, 5% and 10%, respectively. Empathic people tend to guess the highest numbers (i.e further to the winning number in this game).

The “female”coefficients in specification (4) suggest a positive and statistically significant (at 5% level) effect of gender on GQD.

Specifications (7) and (9) show positive numbers guessing for female and are statistically significant at 10% respectively.

Table 13: Guessing Game - Number Guess (OLS Estimates)

VARIABLES	(1) N°-GG	(2) N°-GG	(3) N°-GG	(4) N°-GG	(5) N°-GG	(6) N°-GG	(7) N°-GG	(8) N°-GG	(9) N°-GG	(10) N°-GG
BES	13.706*** (4.346)				10.377** (4.931)	12.390* (7.121)				
IRI		13.367** (5.839)					8.154 (6.382)	7.243 (9.656)		
EQ			23.190*** (8.206)						17.728** (8.609)	33.337** (15.590)
FEMALE				10.963*** (4.034)	6.395 (4.534)	21.375 (38.394)	8.553* (4.445)	3.031 (44.043)	8.079* (4.223)	28.864 (17.825)
BES x FEMALE						-0.200 (0.508)				
IRI x FEMALE								0.059 (0.468)		
EQ x FEMALE										-0.566 (0.472)
EXPERIENCE	-1.229 (3.921)	-1.528 (3.987)	-1.831 (3.945)	-1.750 (3.954)	-1.351 (3.907)	-1.241 (3.930)	-1.610 (3.946)	-1.704 (4.031)	-1.807 (3.905)	-1.572 (3.903)
AGE	0.278 (0.307)	0.196 (0.311)	0.165 (0.308)	0.288 (0.311)	0.322 (0.308)	0.341 (0.313)	0.280 (0.311)	0.277 (0.313)	0.256 (0.308)	0.254 (0.307)
RISK	-0.245 (0.516)	-0.301 (0.525)	-0.312 (0.520)	-0.138 (0.523)	-0.170 (0.517)	-0.183 (0.519)	-0.181 (0.523)	-0.186 (0.527)	-0.198 (0.518)	-0.203 (0.517)
DG	-0.122 (0.091)	-0.138 (0.094)	-0.105 (0.091)	-0.123 (0.092)	-0.136 (0.091)	-0.130 (0.092)	-0.148 (0.094)	-0.150 (0.095)	-0.130 (0.091)	-0.111 (0.092)
CONSTANT	-11.125 (19.143)	-1.492 (21.255)	21.383* (11.486)	34.092*** (9.205)	-3.149 (19.891)	-10.889 (28.041)	8.943 (21.722)	12.053 (32.932)	19.949* (11.394)	5.751 (16.411)
OBSERVATIONS	134	134	134	134	134	134	134	134	134	134
R-SQUARED	0.082	0.050	0.069	0.065	0.097	0.098	0.077	0.077	0.095	0.105

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=interaction empathy test*female p-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Finding 7: Empathic players guesses are farther from the winning number in the GG.

5. Conclusions

Our study explores the relationship between interactive decision-making and empathy. For this purpose, we have used the data collected in a laboratory experiment designed to allow us to test whether such a relationship exists.

After a careful analysis of the experiment's results and the way in which they relate to our initial hypotheses, we can summarize the main findings of this study as follows.

As far as the prosocial behaviour is concerned, the results of the experiment suggest that the differences in people's behaviour can be explained in accordance with their gender and empathy levels. Such correlations are confirmed by the data collected in the Dictator Game (DG), the Trust Games (TG) and the Guessing Game (GG). However, in the other two games conducted; the Ultimatum Game (UG) and the Prisoner's Dilemma (PD), we have not found any such significant correlation.

This outcome might be due to the experiment's design and the fact that, when adopting the strategy method, participants did not interact with other players.

Hypothesis 1 has been confirmed by the experiment in that the more individuals are empathic, the higher their offers in the Dictator Game (DG). This result confirms the link between empathy and prosocial behavior (Singer and Fehr 2005, de Waal 2008). Moreover, by analyzing the data collected from the DG we find that gender affects the "generosity" of the offers, with male participants giving generally less than the female ones.

The results obtained in the first stage of the TG suggest that men have more propensity to trust others than women. Meaning that participants who are giving higher amounts display a strategic behaviour in order to achieve better payoffs than the counterpart. This finding is consistent with the literature (Croson and Gneezy 2009).

As far as strategic behaviour and its relationship with empathy is concerned we have tested the following hypotheses:

- 1) those who accept lower values in the Ultimatum Game (UG) could have higher empathy levels

- 2) the higher the empathy level, the higher the cooperation in Prisoner Dilemma (PD) and

3) the more strategic results in the Guessing Game (GG) are explained by higher levels of empathy.

The results obtained do not confirm the first and second hypotheses. We do not find any statistically significant correlation in these games. An explanation in the UG and PD could be that participants do not know each other and they play in a neutral and one -trial Prisoner Dilemma (PD) . When they play only once the usual answer is that defectors dominate cooperators. The results could be different in an evolutionary design (iterated PD) where the best strategy is to cooperate (for more details see Nowak and Taylor (2007).

As far as the third hypothesis is concerned, the analysis of the data collected suggests that it is not females (with higher level of empathy) but rather men who behave more strategically.

In conclusion our data shows that empathy is related to altruism/spontaneous giving, that is, to behaviours that involve no strategic sophistications in the games played. In games that are played more strategically the role of empathy appears negligible and other factors, such as ToM, for example, may have more effect.

References

- Artinger, F., Exadaktylos, F., Koppel, H., Sääksvuori, L. (2014). In Other's Shoes: Do Individual Differences in Empathy and Theory of Mind Shape Social Preferences? *PLoS ONE*, 9 (4).
- Baron-Cohen, S., Wheelwright, S. (2004). The Empathy Quotient: An Investigation of Adults with Asperger Syndrome or High Functioning Autism, and Normal Sex Differences. *Journal of Autism and Developmental Disorders*, 34 (2), 163-165.
- Battigalli, P., Dufwenberg, M. (2007). Guilt in Games. *American Economic Review*, 97.
- Batson, D., 2011. *Altruism in Humans*. Oxford, Oxford University Press.
- Bernhardt, B. C., Singer, T. (2012). The Neural Basis of Empathy. *The Annual Review of Neuroscience*.
- Bolton, G. E., Ockenfels, A. (2000). ERC: A theory of equity, reciprocity, and competition. *American Economic Review* 90(1):166-193.
- Coke, J., Batson, D., and McDavis, K. (1978). Empathic Mediation of Helping: A Two Stage Model. *Journal of Personality and Social Psychology*, 36, 752-766.
- Coplan, A., and Goldie P., (eds.), (2011). *Empathy: Philosophical and Psychological Perspectives*, Oxford: Oxford University Press.
- Coricelli, G., and Nagel, R. (2009). Neural correlates of depth of strategic reasoning in medial prefrontal cortex. *Proceedings of the National Academy of Sciences*, 106(23).
- Crosan, R., Gneezy, U. (2009). Gender Differences in Preferences. *Journal of Economic Literature*, 47 (2), 448-74.
- Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, 44(1), 113-126
- de Waal, F. B. (2008). Putting the Altruism Back into Altruism: The Evolution of Empathy. *The Annual Review of Psychology* (59), 279-300.
- Decety, J., Ickes, W. (2009). *The Social Neuroscience of Empathy*, Cambridge, Mass.: MIT Press.
- Dovidio, J., Allen L., and Schroeder D., (1990). The Specificity of Empathy-Induced Helping: Evidence for Altruistic Motivation. *Journal of Personality and Social Psychology*, 59, 249-260.

Dufwenberg, M. (2002). Marital Investment, Time Consistency and Emotions. *Journal of Economic Behavior & Organization*, 48, 57–69.

Dufwenberg, M., Kirchsteiger, G. (2004). A theory of Sequential Reciprocity. *Games and Economic Behavior*, 47, 268–298.

Eisenberg, N., Miller, P. A. (1987). The Relation of Empathy to Prosocial and Related Behaviors. *Psychological Bulletin*, 91-119.

Eisenberg, N., Strayer, J., (1987). *Empathy and its development*. Cambridge, Cambridge University Press.

Eisenberg N., Eggum ND., Di Giunta L., (2010) Empathy-Related Responding: Associations with Prosocial Behavior, Aggression, and Intergroup Relations. *Social Issues Policy Review* 4:143–180.

Falk, A., Fischbacher, U. (2006). A Theory of Reciprocity, *Games and Economic Behavior* 54, 293–315.

Fehr, E., Schmidt, K. M. (1999). A Theory of Fairness, Competition and Cooperation. *The Quarterly Journal of Economics*, 817-868.

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

Gallese, V. (2003). The roots of empathy: the shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology*, 36(4), 171-80.

Gazzaniga, M. (2008). *Human. The Science Behind What Makes Us Unique*. Ecco/HarperCollins Publishers, New York.

Greiner, B. (2004). The Online Recruitment System ORSEE - A Guide for the Organization of Experiments in Economics. *Working Paper series University of Cologne, Department of Economics*

Grohn, J., Huck, S., Valasek, J. M. (2014). A Note on Empathy in Games. *Journal of Economic Behavior & Organization*, 108. 383-388.

Hoffman, M. (1977). Sex Differences in Empathy and Related Behaviors. *Psychological Bulletin*, 712-722.

Holt, C. A., Laury, K. (2002). Risk Aversion and Incentive Effects. *The American Economic Review*, 92 (5), 1644-1655.

Hume, D. (1751/2001), *An Enquiry Concerning the Principles of Morals*. “Project Gutenberg” On-line Edition.

Jolliffe, D., Farrington, D., (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence*, 29, 589–611.

Kirman, A., Teschl, M. (2010). Selfish or selfless? The role of empathy in economics. *Philosophical Transactions of the Royal Society - B*, 356, 303-317.

Krebs, L. (1975). Empathy and altruism. *Journal of Personality and Social Psychology*, 32, 1134-1146.

Taylor, C., and Nowak, A. (2007). Transforming the dilemma. *Evolution*, 61(10).

Pelligra, V. (2011). Empathy, Guilt-Aversion, and Patterns of Reciprocity. *Journal of Neuroscience, Psychology and Economics*, 4 (3), 161-173.

Penner, A., Dovidio, F., Piliavin, A., Schroeder, A., (2005) Prosocial behavior: Multilevel perspectives. *Annual Review of Psychology* 56: 365–392.

Preston, D., Hofelich, J., (2011). The Many Faces of Empathy: Parsing Empathic Phenomena Through a Proximate, Dynamic-Systems View of Representing the Other in the Self. *Emotion Review*, 20 (10), 1-10.

Rabin, M. (1993). Incorporating Fairness into Game Theory and Economics, *American Economic Review* 83, 1281 - 1303.

Rizzolatti, G., Fadiga, L., Fogassi, L., Gallese, V. (1996). Premotor cortex and the recognition of motor actions. *Cognitive Brain Research*, 131-141.

Seithe, M. (2012). Introducing the Bonn Experiment System (BoXS). *Bonn Econ Discussion Papers* (01/2012).

Singer, T., Fehr, E. (2005). The Neuroeconomics of Mind Reading and Empathy. *The American Economic Review*, 95 (2), 340-345.

Smith, A. (1759/1976). *The Theory of Moral Sentiments*, Oxford: Oxford University Press.

Stein E. (1917). On the Problem of Empathy: The Collected Works of Edith Stein, vol. 3 *ICS Publications*, 1989 Washington D.C. (Traduzioni: Il problema dell’empatia, a cura di Elio Constantini e Erika Schulze Constantini, Roma 1985).

Chapter 3

Empathy in Socially Responsible Consumption: An Experimental Investigation Using the Vote-With-the- Wallet Game

ABSTRACT: The present lab experiment investigates participants' behavior when asked to choose between two specific types of product: a conventional one and a legal and socially responsible one, which produces a positive externality for society, but costs two times more with respect to the former through playing a Multi-Prisoner Dilemma game (a variant of a Public Good Game).

Our findings show that in a neutral scenario participants behave in the same way. However, when a redistribution policy mechanism, priming for legality or with additional information, effects are produced. We observe that players who register high levels of empathy tend to choose the socially responsible and legality product with greater frequency.

Therefore, our experiment sheds light on how empathy is activated as a consequence of introducing redistribution policy measures, priming and additional information. Moreover, we observe how the behavior of players deviate from the Nash Equilibrium in this Prisoner's Dilemma (PD) game.

Keywords: Empathy, Analysis of Collective Decision-Making, Laboratory Experiment, Redistribution, Conformity.

JEL code: D03, D7, D83, C92, H2

1. Introduction

The present study is concerned with the role played by empathy in the strategic behavior of individuals in a Multiperson Prisoner's Dilemma (MPD) Game. Our main purpose is to analyse the impact of empathy on the underlying action mechanisms in a specific type of Public Good (PG) game and the influence it has in determining individuals' choices.

In order to shed some light on this issue, we implement the Vote-with-the-Wallet Game (VWG) (Becchetti and Salustri, 2015). We test the priming effect in a lab experiment where participants represent consumers who have to choose between two types of product – one produced by a legally¹ rated company that is more expensive but contributes to the public good while the other product has no legal rating. More precisely, we verify whether consumers are willing to pay for this public good when properly informed about it.

In this sense, we are interested in identifying whether consumers act in their own interest and that their choices reflect a concern for the interest of the other participants.

We hypothesize that an individual's other-regarding preferences reflected in the choice to purchase a socially responsible product reveal his/her empathizing ability and, thus, the capacity to "put him/herself in an other's shoes". We argue that an empathetic ability might underlie and determine an individual's responsible choices.

Therefore, the hypothesis we want to test can be expressed as follows:

Individuals who have greater empathizing ability are more inclined to be responsible consumers.

Within this theoretical framework we set up our lab experiment to test in particular that:

1. the legality rating of a product significantly increases the willingness of consumers to pay for products sold by legality-rated companies.
2. fiscal policies that transfer resources from defectors to cooperators increase the consumption share of products sold by legality-rated companies.
3. empathy has significant effects on participants' behavior and the choice they make between two distinct types of products.

In the experiment participants are asked over 20 consecutive rounds to choose between a product that costs more (not identified/identified with the legality rating product in non-framed/framed treatments), and a product that costs less (not identified/identified with the unrated product in non-framed/framed treatments). At the end of each round, the number of players who opted for the two alternatives is revealed.

As in games with redistribution policies, a mechanism that mimics a fiscal advantage for the rated product is introduced at the end of the tenth round. In this way part of the extra gains for “defectors” (i.e. those who bought the cheaper product from the unrated firm) is redistributed to “cooperators” (i.e. those who bought the more expensive product offered by a rated firm).

We also test whether different information structures impact differently on our treatments by comparing choices in the sessions where participants are given information about the past number of cooperators in the same group, and those in sessions where participants are informed about the past average number of cooperators in other treatments with the same characteristics (conformity treatment).

According to our results, the Nash Equilibrium in which all players find it optimal to buy the unrated product is Pareto dominated by the choice of buying the legality rated product for reasonable parametric intervals.

The paper is organized into seven sections (including introduction and conclusions). In second section we make a brief review of the literature related to the topics of redistribution, conformity, framing in a Public Good (PG) game and its connection with empathy. In the third section we describe the Vote with the Wallet Legality game, modelled as a multiperson Prisoners' Dilemma (PD). In fourth section we present our experiment design. In the fifth section we present and discuss results for the hypothesis testing, while in section six we present our econometric findings. The seventh section outlines our conclusions.

2. Literature Review

2.1 Redistribution and Conformity

It is worthwhile noting that the redistribution mechanism tested in our experiment is not far from many policy rules that are already implemented in reality. A significant example relates to feed-in tariffs that provide subsidies to individuals choosing renewable energy (i.e. installing solar

panels) which are paid by all taxpayers in a balanced government budget framework (Couture and Gagnon, 2010; Klein et al. 2008; Mendonça, 2009; European Commission, 2008)³. Feed-in tariffs have been adopted in around 63 countries (for Europe see Directive 2001/77/EC) and largely correspond to our approach of redistributing from defectors to cooperators in a Multiperson Prisoner's Dilemma (MPD) game. From this perspective, our experiment is designed to test whether redistribution policies combined with the legality rating adoption may contribute to the public good of legality, and therefore combat public corruption in the same way as intended with feed-in tariffs that contribute to environmental sustainability.

As far as the conformism treatment in our experiment is concerned, it hinges on the standard definition of conformity and the concept of conditional cooperation found in the literature. The former relates to the degree to which an individual in a group modifies her/his behavior to fit with the views of the society (see Moscovici, 1985 and Cialdini and Trost, 1998). The two main rationales for doing so according to the literature (Carpenter, 2004), are avoiding disutility for deviating from social norms, and taking advantage of the information processed by others.

In a different way, conditional cooperation refers to the inclination to contribute more to a public good the more other subjects contribute (Fischbacher et al., 2001; Fischbacher and Gächter, 2010).

These two definitions imply that conformity is more related to culture and social norms, while conditional cooperation is related to the behavior of players participating in the same game and possibly belonging to the same reference group affecting the player's payoff with their choices.

2.2 Framing in Public Good Games and Empathy

In the present study we focus on the probable framing effect in consumer choices and are also interested to know whether empathy has an influence on participants' behavior in each treatment

Our objective is to answer to the following questions:

³ Indeed, according to a recent European Commission update on renewable energy policies in the European Union (EU), "well-adapted feed in tariff regimes are generally the most efficient and effective support schemes for promoting renewable electricity" (European Commission, 2008).

- i) Why are we studying empathy in a Public Good Game?
- ii) Can our choices have an impact on others?
- iii) Can empathy be considered as an action mechanism that can increase the contribution to the public good?

Singer and Fehr (2005) have “hypothesized” a link between empathic abilities and the prediction of other players’ motives and actions, suggesting a testable hypothesis that people with stronger empathic abilities will be better predictors of other motives and actions. They suggest investigating whether our ability to empathize and to mentalize enables prediction of others’ motives and actions in different situations (Singer and Fehr 2005, p.343). Furthermore (Kirman and Teschl 2010) suggest that the degree of empathy that individuals exhibit is very much dependent on context and social interaction.

According to the ethologist de Waal (2008) empathy induces direct altruism which is confirmed by the psychologist Daniel Batson (1991, 2010) with his empathy-altruism hypothesis. Both scientists find that empathy is a good mechanism to trigger altruism - a motivational state with the ultimate goal being to increase the other’s welfare. We can conclude from their work that empathy can be considered as a good candidate to increase contribution to the public good.

Czap et al. (2013) reported on a framed laboratory experiment using a Water Pollution Game (a type of Public Good Game) to test empathy vs. self-interest framings. The participants behaved in a more egalitarian way with empathy framing than those who were more self-interested and revealed themselves as more profit oriented (Czap et al. 2013).

In another study by (Czap et al. 2010) that involved playing the Excludable or Non-excludable Public Good (PG) game (changes the subsequent behavior of subjects), they put forward the thesis that the more empathetic a person is, the more he/she will invest in a group project. From their results, they concluded that empathy was highly significant in explaining contributions to a public good. They found that the more individuals believe that their actions significantly influence or determine public outcomes, the more they will contribute to the group good.

It is interesting to note that participants’ behavior in a Public Good game cannot be explained only by the framing, but also by other-regarding preferences, including reciprocity and altruism (Czap et al 2010).

3. The Model

By adapting the [Becchetti and Salustri \(2015\)](#) model to the vote-with-the-wallet choice in presence of legality rating, the utility conditional to the choice of voting with the wallet for the legality rating product) (vl) or buying the conventional product (vc) in the simplest two-player game can be expressed as:

$$U_i(S) = \begin{cases} \lambda + \alpha - \gamma & \text{if } S = (vl, vl) \\ \frac{1}{2}\lambda + \alpha - \gamma & \text{if } S = (vl, vc) \\ \frac{1}{2}\lambda & \text{if } S = (vc, vl) \\ 0 & \text{if } S = (vc, vc) \end{cases}$$

where $S := (S^i, S^{-i}) \in \{vc, vl\}^2$ indicates the strategy profile.

The parameter $\lambda \in [0, +\infty)$ measures the total value of the contribution to the public good of legality given by the vote with the wallet legality choice (purchase of the product with legality rating). This is because that choice contributes to transform legality into a competitive factor thereby increasing the advantage that other corporations have in making the legality rating choice and contributing to the public good. This effect however crucially depends on the share of players choosing the (vl) strategy (which is trivial in the two-player version, while less so in the multipersonversion which follows). The parameter $\alpha \in [0, +\infty)$ measures the nonnegative utility arising from the satisfaction of player's other-regarding preferences⁴ (if any) when buying the product with legality rating. The parameter $\gamma \in [0, +\infty)$ represents the price difference between the two choices, that is, the cost difference between the price of the product awarded by the legality rating and that of the conventional product. In the model (and in the experiment structure which

⁴ This assumption finds strong grounds in results from the experimental literature providing ample evidence of distribution and intention-based other regarding preferences such as of (positive and negative) reciprocity ([Rabin, 1993](#)), inequity aversion ([Fehr and Schmidt, 1999](#), and [Bolton and Ockenfels, 2000](#)), other-regarding preferences ([Cox, 2004](#)), social welfare preferences ([Charness and Rabin, 2002](#)), betrayal aversion ([Bohnet and Zeckhauser, 2004](#)) and various forms of pure and impure (warm glow) altruism ([Andreoni, 1989](#) and [1990](#)).

follows) we as well assume for simplicity that players are not income constrained in the game, or that $Y_i > \mathcal{Y}$ for all $i = 1, 2$ (where Y_i is the income of the i -th player).⁵

Following [Becchetti and Salustri \(2015\)](#) we know that, if $G = (N, (S^i)_{i \in N}, (U_i)_{i \in N})$, $N = \{1, 2\}$ and $S^i = \{vl, vc\}$, (vc, vc) is the unique NE of the game when $\frac{1}{2}\lambda + \alpha < \gamma$ and (vl, vl) otherwise. The prisoner's dilemma arises in the area of intermediate values of the extra cost of the legal product \mathcal{Y} where $\frac{1}{2}\lambda + \alpha < \gamma < \lambda + \alpha$. In this interval the strategy pair (vl, vl) Pareto dominates the unique NE - (vc, vc) .

Following again [Becchetti and Salustri \(2015\)](#) $n > 2$, $G_n = (N, (S^i)_{i \in N}, (U_i)_{i \in N})$, $N = \{1, \dots, n\}$, and $S^i = \{v, a\}$ for each $i \in N$ in the multipersonversion of the game. The new payoff function is

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n} \lambda + \alpha - \gamma & \text{if } S^i = vl \\ \frac{j}{n} \lambda & \text{if } S^i = vc \end{cases}$$

with j measuring the number of players choosing the vl strategy in S^{-i} . The unique NE of the game is (vc, vc) when $\frac{1}{n}\lambda + \alpha < \gamma$, while (vl, vl) otherwise. The qualifying difference with respect to the two players' game is the extension of the parametric interval of the PD since the latter occurs when $(\frac{1}{n}\lambda + \alpha < \gamma < \alpha + \lambda)$.

Given our focus on large consumer markets where the number of "players" is very large, results from the multipersongame tell us that the PD is a very relevant issue. As well, [Becchetti and Salustri \(2015\)](#) show that mutual conventional voting has problems in terms of renegotiation proofness and the formation of a coalition of voters has the paradoxical effect of increasing the value of free-riding/ buying conventional strategies. These considerations make the introduction of redistribution policies even more relevant.

⁵ Said in other terms this implies that only players without income constraints can participate to the game.

4. The Experimental Design

The experiment consists of 18 sessions. During each session a group of 10 participants plays 20 consecutive rounds of the VWG choosing, in each one of them, between product A and product B. We consider a variety of treatments, such as baseline condition, legality frame and conformism. We were able to test different actions and infer motives for such actions.

We consider the treatments as follow:

1. In the “baseline” treatment only basic neutral instructions⁶ are provided. No explanation is given neither about why *A* is more expensive than *B* (i.e. 10 Experimental Currency Units (ECUs) against 5 ECUs, where 2 ECUs=1 euro), nor about the reason why players get a bonus (i.e. 3 ECUs representing the positive externality of each voter for legality while the total market contribution to the public good is 30 if all players buy product A) each time *A* is opted for.

In each session the 20 rounds are divided into two phases: in the “no redistribution phase” 10 rounds are played as described above; in the “redistribution phase” in each of the other 10 rounds, part of the payoff (i.e. 1 ECU) is taken from each player buying product *B*, and reallocated at the end of each round in equal parts among those who chose product *A*. This treatment is supposed to mimic a policy action aimed to redistribute resources from defectors to co-operators.

2. In the “frame” treatment the game is played as in the “baseline” but now a non-neutral description of the two products is given to the participants. More precisely, the players are told that product *A* is provided by a company awarded by a 3-star ICA legality rating (the participants can read detailed characteristics of the legality rating system in a leaflet provided by experimenters).
3. The “conformity” treatment is similar to the “frame” treatment but now we provide information about how many players on average bought product *A* during the corresponding rounds in those sessions which have the same characteristics. This kind of information, instead of the number of co-operators in the same group, is used to appraise to what extent players tend to conform to prior evidence that they come to be aware of (i.e. players in sessions 13 to 15 (16 to 18) are told the average share of cooperators observed in sessions 7-

⁶ See Appendix 2 for full instruction details.

9 (10-12) respectively). In this way, our design aims at disentangling the effect of conditional cooperation from conformity-driven effects.

The above three treatments are brought together in 6 combinations, each of them repeated for 3 consecutive sessions as shown in Table 1.

Table 1. Experimental design

Treatment	No. of sessions	Phase 1 (10 rounds)	Phase 2 (10 rounds)	Phase 3	No. of players
Baseline	1 - 3	Baseline	Redistribution	Questionnaire	30
	4 - 6	Redistribution	Baseline	Questionnaire	30
Frame	7 - 9	Frame	Frame + Redistribution	Questionnaire	30
	10 - 12	Frame + Redistribution	Frame	Questionnaire	30
Conformity	13 - 15	Frame (conformity)	Frame (conformity) + Redistribution	Questionnaire	30
	16 - 18	Frame (conformity) + Redistribution	Frame (conformity)	Questionnaire	30

4.1 Experimental Procedures

The data for the present study was collected by means of an experiment administered by the Behavioral Economics Research Group (BERG) of the University of Cagliari (Italy) in November 2015. The BERG recruited 180 volunteers (with exact gender balance in each session) from students studying different academic disciplines.

The overall experiment accounted for 18 sessions with 10 participants playing their own games from a computer terminal that each of them had been randomly assigned to. The z-Tree platform ([Fischbacher, 2007](#)) was used to program the experiment.

After the participants reached their respective terminals, general instructions were read aloud and they were informed that the experiment consisted of two phases, but they received only the specific instructions for phase one. Questions about the structure of the game, the procedures and the payment rules were then answered privately. Participants played the first ten rounds of the game.

When everyone had completed phase one, participants were given instructions for phase two which were read aloud. The exact sequence of what happened in each round is as follows: i) experimenters asked each player her/his belief about the number of co-operators in each round; ii) the players play the VWG (in the baseline, frame or conformity variant); iii) the number of co-operators for that round (but not their identity) is publicly revealed; iv) players are asked to grade (on a 0-10 scale) their satisfaction rating for the game, for their own behavior and for the behavior of other players in the session with three different questions.

At the end of the 20th period (i.e. the second part) of every session, each participant was asked to fill out two questionnaires: one used to identify his/her empathic traits, for which purpose we implemented the Interpersonal Reactivity Index⁷ (IRI) developed by [Davis \(1983\)](#). With the other questionnaire eliciting participants' socio-demographic characteristics, degree of trust towards the others, satisfaction with life, political orientation, and use of social networks (see Appendix experiment 2).

Eventually 1 of the 20 rounds played by each player is drawn randomly at the end of each session, and cashed to her/him together with her/his profit from the whole game. Moreover each participant gets a gratuity of 5 ECUs as a participation fee, and this token sums up to the final individual earnings. Last, players are paid 5 ECUs if they guess correctly the number of co-operators in an extracted round in order to incentivize the formulation of their beliefs.

With reference to the [Becchetti and Salustri \(2015\)](#) model described in section 3, the relevant parameters for the experiment are set as follows:

$$n = 10, \quad \lambda = 30, \quad \gamma = 5$$

with $\alpha = 0$ for simplicity. This implies that players' payoff function may be written as⁸

⁷ A psychometric measurement of empathy based on a 28 items test (containing 4 macro-factors, each composed of 7 single items) developed by Davis in order to underline the different aspects of empathy. This test applied in both the economic and neuroscience literature ([Artinger 2014](#), [Singer et al. 2004,2006](#)) provides distinct assessments of the cognitive, perspective-taking capabilities and emotional reactivity of individuals.

⁸ Note that in our utility function we do not have the endowment since the parameters are expressed as differentials between the choice of vote and the choice of abstain.

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n} \lambda - \gamma & \text{if } S^i = vl \\ \frac{j}{n} \lambda & \text{if } S^i = vc \end{cases}$$

$$= \begin{cases} \frac{j+1}{10} 30 - 5 & \text{if } S^i = vl \\ \frac{j}{10} 30 & \text{if } S^i = vc \end{cases}$$

where j is the number of players who chose the strategy vl strategy in S^i . Given the parametric values chosen in our experiment, (vc, vc) is the unique (inefficient) NE of the multiperson game in the baseline treatment since $\frac{1}{n} \lambda + \alpha < \gamma < \lambda + \alpha$ (i.e. $3 < 5 < 30$). However in the redistribution treatment things change and cooperating players have non-inferior payoffs if they are less than three (see Table A2.4 in Appendix experiment 2).

Note as well that welfare calculated as the sum of product sales' revenues (if we consider the cost paid to purchase one of the two products as welfare for product sellers) or as the sum of players' profits is monotonically increasing in the number of cooperative choices since the latter produce a sizeable externality for all other players.

5. Hypothesis

In order to outline formally the hypotheses to be tested in the experiment let us define $C(i,t)$ as the strategy selected in round t by the i -th player of game G , where $G \in \{\text{Base, Legality Frame, Legality Frame Conformity, Redistribution, Redistribution Legality Frame Conformity}\}$ indicates the session type with $C \in \{vl, vc\}$, vl being the strategy of choosing the "responsible" product (product A) and vc the strategy of choosing the conventional product (product B).

Based on these definitions and by conveniently setting the strategy $vl=0$ and the strategy $vc=1$, we can test:

Hypotheses 1: (no effect of the legality frame in absence of redistribution policies)

$$H_0: C_{i,t}(\text{Base}) = C_{i,t}(\text{Legality Rating})$$

$$H_A: C_{i,t}(\text{Base}) \neq C_{i,t}(\text{Legality Rating})$$

With this hypothesis we test the null of absence of effects of the legality rating frame vis-à-vis the “blind” VWG benchmark. In the blind benchmark players know by inspecting game payoffs that, when purchasing the more expensive product a positive externality is created for all players irrespective of the choices of the latter. No other information or meaning is given to the two products. Note as well that in this base treatment, under the NE the share of players choosing the more expensive good incorporating the public good component (*vc* strategy) should be zero.

Hypothesis 2: (no redistribution effect under the blind vote with the wallet game)

$$H_0: C_{i,t}(\text{Base}) = C_{i,t}(\text{Redistribution})$$

$$H_A: C_{i,t}(\text{Base}) \neq C_{i,t}(\text{Redistribution})$$

We test the null hypothesis that the redistribution mechanism has no effect in the “blind” Vote with the Wallet game where the more expensive product that incorporates the public good component is not identified with the legality rating product. Rejection of this hypothesis in direction of a significantly higher share of cooperators under the policy mechanism would imply that a balanced budget policy device redistributing from defectors to cooperators significantly increases the share of cooperators and, with it, total welfare in the game (measured as the sum of utilities of all players).

Hypothesis 3: (no policy effect under legality rating frame)

$$H_0: C_{i,t}(\text{Legality Rating}) = C_{i,t}(\text{Redistribution Legality Rating})$$

$$H_A: C_{i,t}(\text{Legality Rating}) \neq C_{i,t}(\text{Redistribution Legality Rating})$$

Under hypothesis 3 we test the null hypothesis that the redistribution policy in presence of the legality frame has no effects on the share of “responsible” choices.

Hypothesis 4: (non differential base/legality rating redistribution effect)

$$H_0: C_{i,t}(\text{Redistribution}) = C_{i,t}(\text{Redistribution Legality Rating})$$

$$H_A: C_{i,t}(\text{Redistribution}) \neq C_{i,t}(\text{Redistribution Legality Rating})$$

The null hypothesis 4 is that the legality frame makes no significant difference in the share of players voting for the legality rated product in presence of the policy redistribution mechanism.

The combination of these tests provides important insights relating to the relevance/effectiveness of the frame and of the policy mechanisms. As well, a significant departure from a zero share of players choosing the (v1) strategy in the base and in the legality frame treatments implies departure from the NE.

Note finally that it is possible to verify the welfare effects of the redistribution mechanism in the blind Vote with the Wallet game by calculating the average difference in payoffs between players in the base and in the redistribution mechanism. Since the redistribution mechanism is the balanced budget the total welfare gain is the product of the average difference for the number of players participating to the game. The same approach can be followed to verify the welfare effect of the redistribution mechanism under the legality frame.

Similar hypotheses can be formulated to compare the effect of providing information about the other members of the same group versus the effect of information about the average behavior of members of the other groups in the same treatments. This comparison allows us to disentangle behaviours inspired by conditional cooperation from those driven by simple conformity.

In order to test the Empathy Effect, our hypothesis is that:

Hypothesis 5: (People with high empathy levels are more likely to choose the responsible product in each treatment: base, legality frame and conformism)

5.1 Empirical Findings

Experimental findings show that the null of hypothesis 1 is rejected and the legality frame matters (Table 2). More specifically the frame raises by around 9 percent the share of cooperators (from 27.8 to 36.5 percent) (χ^2 10.33, p-value 0.001) under the standard (non conformity) information treatment. The share of cooperators is slightly higher under the conformity information

treatment (39.8 percent) and significantly higher than under the base treatment also in this case (χ^2 19.297, p-value 0.001).

The share of cooperators in the redistribution treatments is significantly different from the corresponding shares in non-redistribution treatments, and more so under the base than under the legality framed treatments (hypotheses 2 and 3). More specifically, the share of players choosing the more expensive product rises to 37.5 percent with the introduction of the redistribution mechanism in the base treatment (χ^2 12.745, p-value 0.000), to 41.7 percent in the legality frame treatment (but the significance of the difference vis-à-vis the non-redistribution framed treatment is much weaker given the effect of the frame, χ^2 3.364, p-value 0.067) and to 45.3 percent in the legality frame treatment with conformism (again a weaker difference vis-à-vis the non redistribution frame with conformism, χ^2 3.712, p-value 0.054). The issue in the last two cases is that the legality frame already raises the share of cooperators with respect to the base treatment so that the additional effect of the redistribution policy is much weaker. If we look at the average share of cooperators in the non-framed treatments with redistribution (37.5 percent) and the average share of cooperators in the legality framed (non redistribution) treatments (36.5 and 39.8 percent) we find that they are very close suggesting that the legality rating is almost a substitute of the redistribution policy in absence of the frame.

The average share of cooperators in the framed redistribution treatments (in both the conformity and non-conformity treatments) is higher than under the (non-framed) redistribution treatments (45.3 and 41.7 vs 37.5 percent), but the legality frame produces a significantly higher share of cooperators in redistribution treatments only in the first case (χ^2 7.587, p-value 0.006).

When splitting the redistribution effect between sessions where the redistribution treatment comes first and those where redistribution comes after we find that the effect is concentrated on the first case. That is, the most relevant effect is the fall in the share of cooperators in sessions starting with redistribution after redistribution ceases.

For a synthetic view of our findings note that the combination of frame, redistribution mechanism and conformity treatment (sessions 13-15 in the second ten rounds and sessions 16-18 in the first ten rounds) produces a growth in the production of the positive externality of around 63 percent vis-à-vis the benchmark base treatment, while the same growth is 31, 35 and 43 percent in the frame, redistribution and frame plus conformity treatments respectively. Note as well that the legality frame under the conformity information treatment (sessions 13-15 in the first ten rounds

and sessions 16-18 in the second ten rounds) produces a share of co-operators close to 40 percent, well above the NE of that treatment in which no one should cooperate.

Table 2. Hypothesis testing

<i>Alternatives compared</i>	<i>Obs</i>	<i>Players (%) cooperating with each alternative</i>	<i>Pearson χ^2</i>	<i>P-value</i>
Base vs Redistribution	1200	0.278 - 0.375	12.745	0.000
Frame vs Redistribution Frame	1200	0.365 - 0.417	3.364	0.067
Frame (conformity) vs Redistribution Frame (conformity)	1200	0.398 - 0.453	3.712	0.054
Base vs Frame	1200	0.278 - 0.365	10.327	0.001
Base vs Frame (conformity)	1200	0.278 - 0.398	19.297	0.000
Redistribution vs Redistribution Frame	1200	0.375 - 0.417	2.178	0.140
Redistribution vs Redistribution Frame (conformity)	1200	0.375 - 0.453	7.587	0.006
Base - before vs Redistribution - after	600	0.337 - 0.363	0.469	0.494
Base - after vs Redistribution - before	600	0.22 - 0.387	19.717	0.000
Frame - before vs Redistribution Frame - after	600	0.403 - 0.403	0.000	1.000
Frame - after vs Redistribution Frame - before	600	0.327 - 0.43	6.810	0.009
Frame (conformity) - before vs Redistribution (conformity) Frame - after	600	0.383 - 0.433	1.552	0.213
Frame (conformity) - after vs Redistribution (conformity) Frame - before	600	0.413 - 0.473	2.188	0.139

5.2 Empathy Findings

Table 2.1 shows the hypothesis testing for each treatment by empathy level (high or low). In the baseline treatment, empathy does not have any effect. Therefore, we cannot reject the null hypothesis regarding empathy differences in the neutral scenario.

In treatments (2 to 6) we observe that participants' cooperative attitude increases significantly in each treatment and in particular: i) in the redistribution one- by 41 percent; ii) in the legality framing one - by 42 percent; iii) in the redistribution and the legality frame - by 44 percent; iv) in the case of legality framing under the conformity treatment - by almost 45 percent; v) the redistribution phase under the conformity treatment produces a share of co-operators close to 50 percent, that is, significantly higher than the NE of the game in which no one should cooperate.

Table 2.1 Hypothesis Testing-Empathy Levels

<i>Alternatives compared</i>		<i>Obs</i>	<i>Players (%) cooperating with each alternative</i>	<i>P-value</i>
	1. Baseline: Low Emp. Vs High Emp.	600	0.290 - 0.262	0.115
<i>Different Empathy Level</i>	2. Redistribution: Low Emp. Vs High Emp.	600	0.345 - 0.411	0.000
	3. Frame: Low Emp. Vs High Emp.	600	0.306 - 0.423	0.000
	4. Redistribution Frame: Low Emp. Vs High Emp.	600	0.386 - 0.446	0.002
	5. Frame (Conformity): Low Emp. Vs High Emp.	600	0.344 - 0.448	0.000
	6. Redistribution (Conformity): Low Emp. Vs High Emp.	600	0.406 - 0.496	0.000
	<i>Same Empathy Level</i>	7. Base High Emp. Vs Frame High Emp.	570	0.262 - 0.423
8. Base High Emp. Vs Conformism High Emp..		580	0.262 - 0.448	0.000
9. Base Low Emp. Vs Frame Low Emp.		630	0.306 - 0.290	0.341
10. Base Low Emp. Vs Conformism Low Emp.		620	0.344 - 0.290	0.001
<i>Same Empathy Level</i>	11. Red High Emp. Vs Frame Red High Emp.	570	0.411 - 0.446	0.070
	12. Red High Emp. Vs Conf Red High Emp.	580	0.411- 0.496	0.000
	13. Red Low Emp. Vs Frame Red Low Emp.	630	0.386 - 0.345	0.000
	14. Red Low Emp. Vs Conf Red Low Emp.	620	0.406 - 0.345	0.000

In treatments (7 to 10) we compare the baseline condition versus legality frame and conformism treatments, for each empathy level. All the results for all treatments show statistically significant differences, except in the case of the difference between baseline and legality framing for low empathy level individuals.

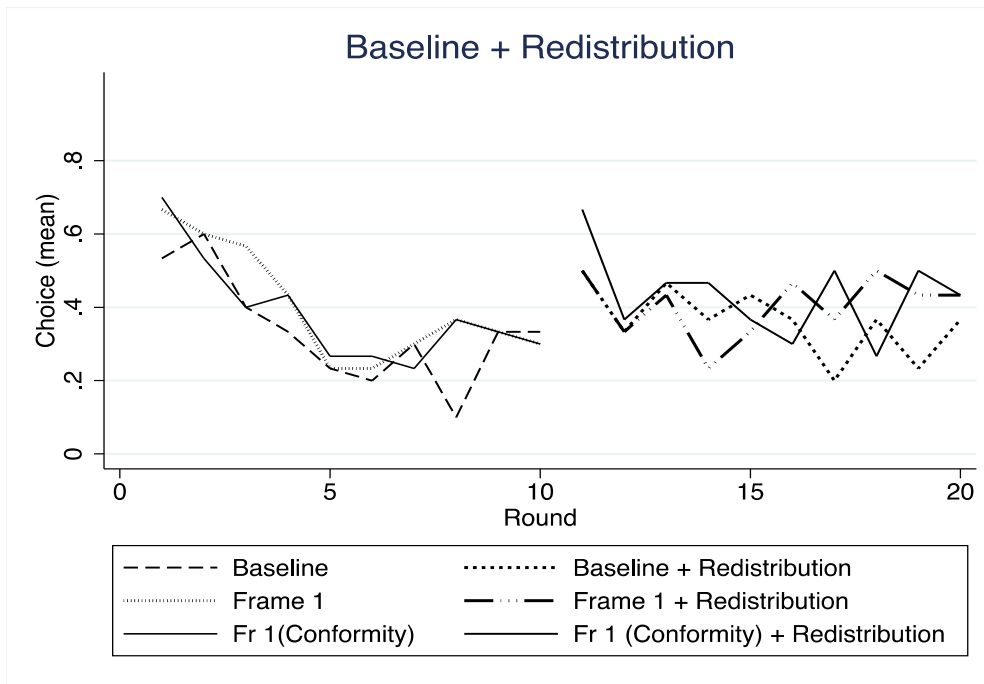
In treatments (11 to 14) comparing redistribution versus legality redistribution framing and conformism we find significant variations amongst all the treatments, indicating that different empathy levels have an important influence on the participants' behavior, which supports our hypothesis number 5.

5.3 Dynamic Descriptive Findings

The dynamics of the average share of cooperators plotted in Figures 1A-1B provide further insights into what lies behind the results from static tests. In the non-framed sessions starting with

the base treatment, the number of cooperators in the first round is 53 percent and irregularly declines down to 33 percent in the last (10th) non-redistribution round (Figure 1A).

Figure 1.A The Average Share of Cooperators Phase 1: Baseline



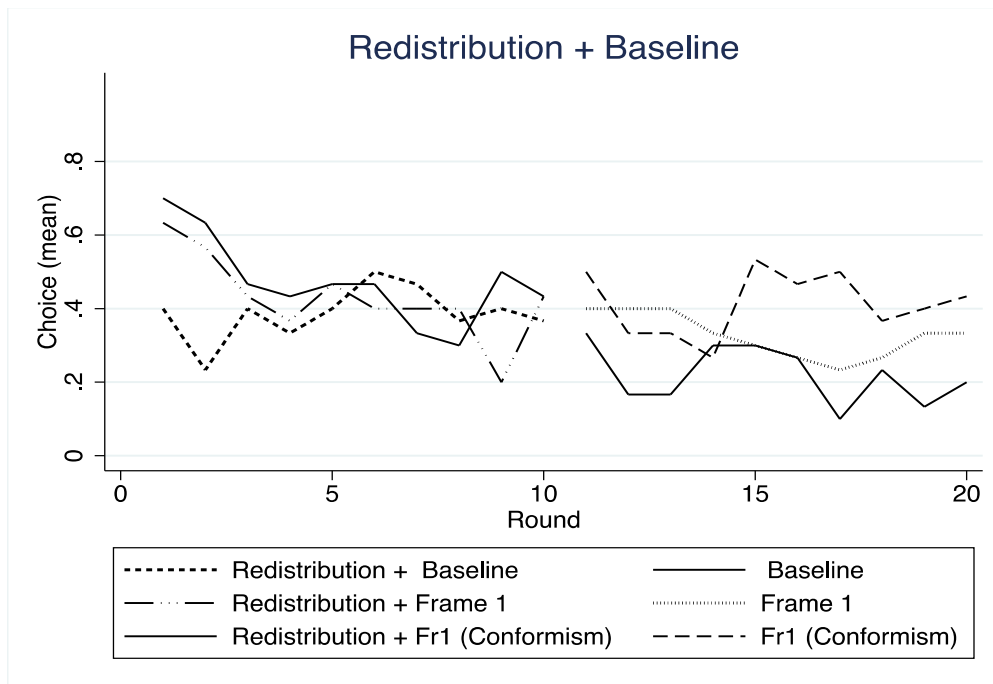
With the first round shares of cooperators in framed sessions starting with the absence of redistribution mechanisms are higher (70 and 66 percent respectively under the conformity and non conformity treatments), reflecting the relevance of the legality frame. They however irregularly decline to a final share of 30 and 33 percent respectively. The jump generated by the introduction of the redistribution mechanism is sharp bringing the share of cooperators to 66 (in framed conformity sessions) and 50 percent (in framed non conformity sessions).

The patterns of sessions starting with redistribution treatments are different than expected. In the non-framed sessions, we start with an average share of cooperators of 40 percent and we end up with 36 percent in the 10th session. The elimination of the redistribution mechanism produces a downward jump to 33 percent leading to the “equilibrium” share of cooperators of 20 percent in the last session (Figure 1B).

The initial share of cooperators in the framed sessions starting with the redistribution mechanisms are higher (70 and 63 percent respectively in the conformity and non conformity

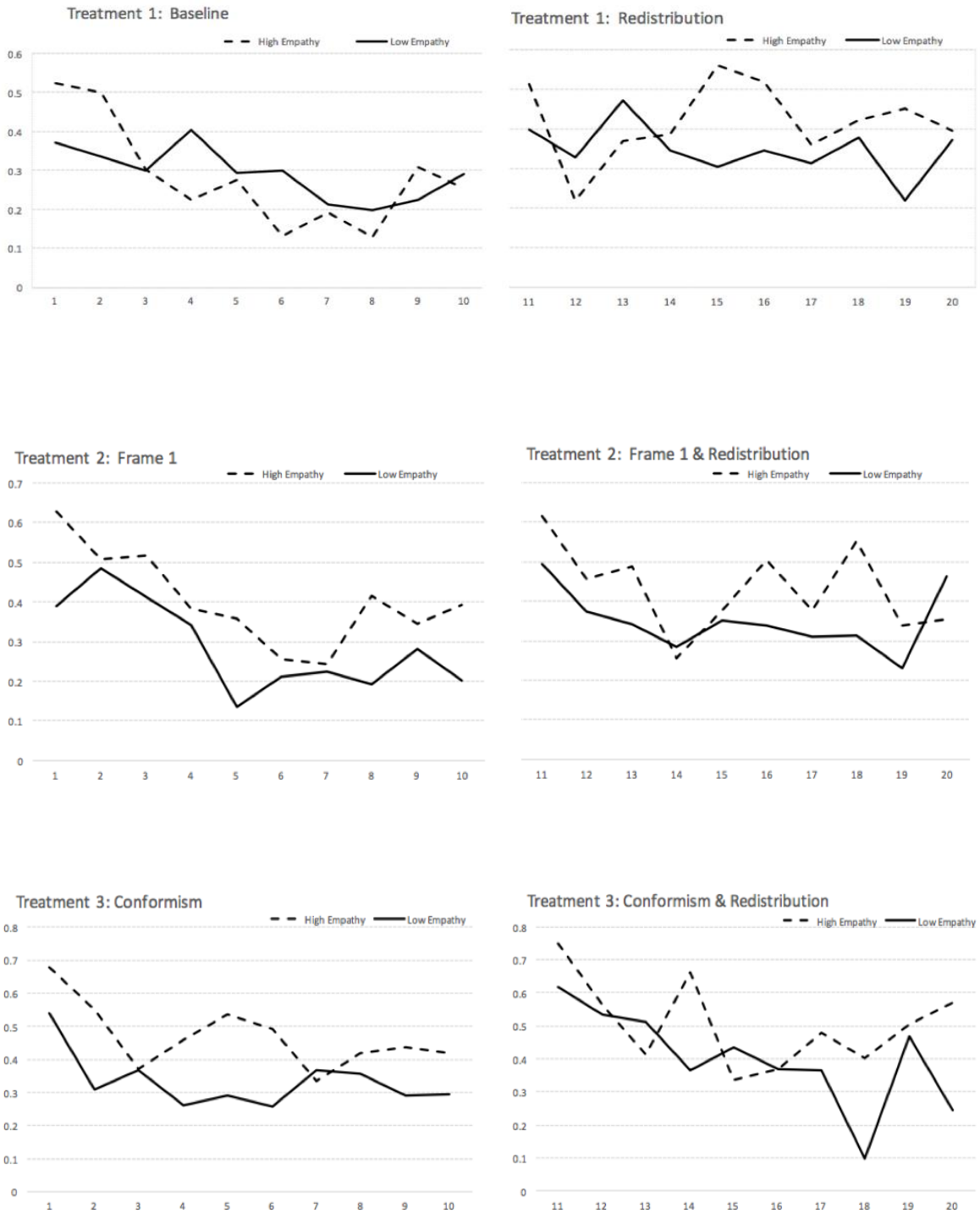
treatments). In both cases the shares fall to 43 percent in the last session before the end of the redistribution mechanism. There is almost no downward jump in the 11th session when the redistribution mechanism is removed and the final shares of cooperators are respectively 43 and 33 percent (above the equilibrium level of 20 percent).

Figures 1.b The Average Share of Cooperators Phase 1: Redistribution



To summarize, we observe that cooperative behaviour is more frequent in the initial rounds of each treatment and declines afterwards. A possible explanation for such a trend might be the knowledge of the others' behaviour gained by the participants.

Figures 2a-2f. Share of Players Choosing The “Responsible” Product “A” Under Different Treatments by High and Low (Levels of Empathy)



Figures 2a-2f show in graph form the hypothesis testing findings described in Table 2.1. The overall results show that participants with a high empathy level more often choose on average product A compared with participants having low empathy levels. Overall participants with high levels of empathy choose on average product A. (Exception to this trend is only observed in Fig.2a and Fig.2b for rounds 11 to 13).

5.4 Dynamic Hypothesis Testing

In order to identify the statistically significant factors driving the dynamics of the vote with the wallet game we estimate the following fully augmented logit specification

$$PGChoice_{i,t,s} = \beta_0 + \beta_1 AvgGroupPGChoice_{t-1,s} + \beta_2 RedistributionBase_{t,s} + \beta_3 LegFrame_{t,s} + \beta_4 LegFrameRedistribution_{t,s} + \beta_5 LegConfFrame_{t,s} + \beta_6 LegConfFrameRedistribution_{t,s} + \beta_7 Round + \beta_8 [E(AvgGroupPGChoice_{t-1,s}) - AvgGroupPGChoice_{t-1,s}] + \sum \theta_i Empathy_i + \sum \delta_i SocioDem_i + \varepsilon_{i,t,s} \quad (2)$$

where *PGChoice* is a (0/1) dummy taking value 1 if the *i*-th individual purchases in session *s* at round *t* the relatively more expensive product A generating a positive payoff externality for the other player. The first regressor - *AvgGroupPGChoice*_{*t-1,s*} - is the lagged average share of responsible voters. Note that the (one round) lagged average players' choice considered in all treatments excluding the conformity treatments is that choice for which the player is informed, that is, the (one round) lagged average choice of players in the same session (see experiment instruction in Appendix experiment 2).

In conformity treatments the information corresponds to the mean of the three (one round) lagged average players' choices in the corresponding non-conformity sessions (i.e. the average of what happened in sessions 7-9 (10-12) for each session going from 13 to 15 (16 to 18)). The substantial difference between the two cases is that in the first we reveal an information directly affecting players' payoffs, while in the second case information that may produce cultural conformity but does not affect directly players' payoffs. Hence, the absence of conditional cooperation implies that $\beta_1=0$ (excluding conformity treatments from the estimate) while we have conditional cooperation when β_1 is positive and significant under non-conformity treatments and conformity when β_6 is positive and significant under conformity treatments.

The variables that follow in the specification pick up intercept changes in the presence of different types of treatments. *RedistributionBase* is a dummy equal to 1 if the redistribution

mechanism is applied in the baseline session s at round t , *LegFrame* (*LegFrameConformity*) is a dummy equal to 1 if the legality frame (legality frame with conformity) treatment applies, while the *LegFrameRedistribution* and *LegConfFrameRedistribution* dummies pick up the two (non-conformity and conformity) framed treatments with redistribution mechanism. The base treatment is the omitted benchmark. The variable *Round* picks up the round number thereby controlling for the presence of dynamic effects in the share of cooperators. $E(AvgGroupPGChoice_{i,t-1,s}) - AvgGroupPGChoice_{t-1,s}$ is a variable picking up the effect of past errors in the expectation on the number of cooperating players. The *empathy* variable captures the empathy level as measured by the Interpersonal Reactivity Index (IRI) psychological measurement (Davis 1983), *SocioDem* variables capture the socio-demographic factors we add as controls in the estimates⁹ (age, gender, mother education, father education, mother professional status, father professional status). The detailed definitions of variables used in econometric estimates are provided in Table 3.1.

5.5 Econometric Findings

The first specification includes just dummies for different treatments, while in the augmented specifications that follow we gradually introduce socio-demographic controls (Table 3.2, columns 1 and 2). The *Round* variable is negative and significant documenting that the decay effect already observed in Figures 1A-1B (the number of players making the cooperative choice that progressively falls as far as the number of rounds grows) is econometrically significant.

The null of absence of conformity/conditional cooperation¹⁰ is rejected since the coefficient of the lagged players' choice (β_1) is positive and significant. Its positive sign implies that a fall in the share of cooperators in the previous round reduces the probability of the player's cooperative choice in the round that follows. Coefficients on dummies picking up different treatments show that redistribution always generates a significant increase in the probability of a cooperative choice whatever the underlying reference treatment (base, frame with/without conformism in the other session rounds). The legality frame is positive but not significant in the dynamic estimate.

⁹ For further details on the socio-demographic variables and their impact see questions 1-11 of the Questionnaire in Appendix 3 and detailed descriptive and econometric findings in Appendix 4.

¹⁰ This variable picks up both conformity and conditional cooperation since it is common to conformity and non-conformity treatments. The test is differentiated in the separate estimates that follow in Tables 4 and 5.

Table 3.2 The determinants of the cooperative choice: dynamic estimates

(dependent variable: (0/1 dummy taking value one if player chooses product A))

	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{t-1}	0.600** (0.290)	0.880*** (0.278)	0.609** (0.291)	0.487* (0.293)
RedistributionBase	0.619*** (0.152)	0.581*** (0.151)	0.616*** (0.151)	0.587*** (0.152)
LegFrameRedistribution	0.753** (0.345)	0.831** (0.336)	0.882*** (0.339)	0.818** (0.336)
LegConfFrameRedistribution	0.962*** (0.350)	0.943*** (0.339)	1.008*** (0.342)	0.979*** (0.339)
LegFrame	0.417 (0.346)	0.522 (0.336)	0.548 (0.339)	0.498 (0.336)
LegConfFrame	0.562 (0.349)	0.578* (0.339)	0.606* (0.342)	0.616* (0.338)
Round	-0.026*** (0.008)		-0.026*** (0.008)	-0.020** (0.009)
E (AvgGroupPGChoice _{t-1}) - AvgGroupPGChoice _{t-1}				0.086*** (0.025)
Socio-demographics		√	√	√
Constant	-1.253*** (0.281)	-1.142 (1.342)	-0.797 (1.357)	-1.067 (1.343)
	52.01	79.95	88.04	99.79
Wald χ^2	(0.00)	(0.00)	(0.00)	(0.00)
Observations	3,420	3,420	3,420	3,420
Number of id	180	180	180	180

□

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

If we augment our specification with the difference between the one period lagged belief on the share of cooperative choices and the one period lagged share of cooperative choices we find that the variable is positive and significant (Table 3.2, column 4). This implies that players do not follow an error correction rule in their choices.

In table 3.3 we include the empathy scores which show that there is a statistically significant probability that participants with high empathy level choose to buy the socially responsible product.

Table 3.3 The determinants of the cooperative choice: dynamic estimates (including Empathy)
 (dependent variable: (0/1 dummy taking value one if player chooses product A))

	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{t-1}	0.614** (0.291)	0.605** (0.291)	0.630** (0.291)	0.507* (0.294)
RedistributionBase	0.617*** (0.152)	0.617*** (0.151)	0.613*** (0.151)	0.585*** (0.152)
LegFrameRedistribution	0.777** (0.342)	0.749** (0.338)	0.887*** (0.333)	0.823** (0.330)
LegConfFrameRedistribution	0.960*** (0.346)	0.910*** (0.343)	0.993*** (0.336)	0.964*** (0.333)
LegFrame	0.444 (0.343)	0.415 (0.338)	0.556* (0.333)	0.506 (0.330)
LegConfFrame	0.561 (0.346)	0.510 (0.342)	0.591* (0.335)	0.602* (0.332)
Round			-0.026*** (0.008)	-0.020** (0.009)
E (AvgGroupPGChoice _{t-1}) - AvgGroupPGChoice _{t-1}				0.086*** (0.025)
Empathy	0.015** (0.007)	0.022*** (0.008)	0.021*** (0.008)	0.020*** (0.007)
Socio-demographics	√	√	√	√
Constant	-2.707*** (0.758)	-4.318*** (1.116)	-3.471** (1.654)	-3.702** (1.636)
Wald χ^2	56.09 (0.00)	64.61 (0.00)	96.15 (0.00)	107.94 (0.00)
Observations	3,420	3,420	3,420	3,420
Number of id	180	180	180	180

□

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

In Tables 4 and 5 we repeat our estimates by considering in separate estimates the legality frame with and without the conformity treatment.

Table 4. The determinants of the cooperative choice: dynamic estimates (framed conformity sessions excluded)

(dependent variable: (0/1 dummy taking value one if player chooses product A)

	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{t-1}	0.474 (0.341)	0.887*** (0.323)	0.481 (0.342)	0.376 (0.343)
RedistributionBase	0.623*** (0.151)	0.570*** (0.150)	0.622*** (0.151)	0.580*** (0.152)
LegFrameRedistribution	0.761** (0.303)	0.910*** (0.301)	0.987*** (0.305)	0.893*** (0.299)
LegFrame	0.424 (0.303)	0.609** (0.301)	0.652** (0.305)	0.580* (0.298)
Round	-0.036*** (0.010)		-0.036*** (0.010)	-0.029*** (0.010)
E (AvgGroupPGChoice _{t-1}) - AvgGroupPGChoice _{t-1}				0.111*** (0.029)
Constant	-1.076*** (0.272)	-1.191 (1.373)	-0.703 (1.397)	-1.048 (1.363)
Socio-demographics		√	√	√
	44.07	66.53	76.85	92.27
Wald χ^2	(0.00)	(0.00)	(0.00)	(0.00)
Observations	2,280	2,280	2,280	2,280
Number of id	120	120	120	120

□

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Our findings show that the conditional cooperation effect and the impact of the legality frame are stronger in magnitude under the conformity treatment (even though only weakly significant in the second case).¹¹ As well the “error correction” term is no more positive and significant (Table 5). The fact that information on other players behavior is processed differently in conformity treatment

¹¹ We test whether there is a significant difference with a dummy picking up the differential conditional cooperation effect in the overall sample estimate of Table 3.1 but the dummy is not significant. Hence the difference between the two coefficients observed in Tables 4 and 5 is not statistically significant.

sessions (where players are informed not about past behavior of those in their same session but about the average past behavior of those playing in the three sessions of the same kind without conformity treatment) is documented by a specific test where we check whether the difference between beliefs about the number of cooperators and the actual number of cooperators is the same in non-conformity versus conformity treatments.

More specifically, we test whether:

$$H_0: E_i[nCoop_{t,t} (Conformity)] - [nCoop_{t-1} (Conformity)] = E_i[nCoop_{t,t} (NonConformity)] - [nCoop_{t-1} (NonConformity)]$$

where $E_i[nCoop_{t,t} (Conformity)]$ is the expected number of cooperators in one's own session formulated at time t after information on co-operators in $t-1$ is revealed and *Conformity (NonConformity)* indicates all sessions with/without the conformity treatment.

Table 5. The determinants of the cooperative choice: dynamic estimates (framed non conformity sessions excluded)

	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{t-1}	0.702*	1.042***	0.700*	0.598
	(0.416)	(0.385)	(0.416)	(0.421)
RedistributionBase	0.611***	0.571***	0.610***	0.597***
	(0.154)	(0.153)	(0.154)	(0.154)
LegConfFrameRedistribution	0.982***	0.984***	1.042***	1.023***
	(0.360)	(0.353)	(0.356)	(0.355)
LegConfFrame	0.554	0.577	0.611*	0.618*
	(0.360)	(0.354)	(0.356)	(0.355)
Round	-0.023**		-0.023**	-0.020*
	(0.011)		(0.011)	(0.011)
E (AvgGroupPGChoice _{t-1}) - AvgGroupPGChoice _{t-1}				0.049
				(0.031)
Constant	-1.325***	-1.448	-1.152	-1.249
	(0.319)	(1.869)	(1.884)	(1.876)
Socio-demographics		√	√	√
	39.24	69.55	73.00	75.52
Wald χ^2	(0.00)	(0.00)	(0.00)	(0.00)
Observations	2,280	2,280	2,280	2,280
Number of id	120	120	120	120

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

□

(dependent variable: (0/1 dummy taking value one if player chooses product A)

We find that the null is rejected in direction of a narrower difference in the conformity treatment (t-stat 3.852, p-value 0.000). This implies that experiment participants adjust their belief more when having information on what players in other similar sessions have done (conformity treatment) than when having information on what players of their same session have done (non-conformity treatment). On the contrary, the same difference when we look at choices and not at beliefs is not significant. The combined effect of these findings supports the hypothesis that players are influenced relatively more by information under the conformity treatment in terms of beliefs, even though econometric findings rejecting the error correction hypothesis document that this is not the case for choices.

6. Conclusion

In the present study using a lab experiment, we verify whether individuals with a greater empathizing ability are more inclined to responsible consumption. This finding sheds light on the real-life dynamics and mechanism of such a phenomenon. The results obtained suggest the existence of a certain willingness among the participants in our experiment to pay for legality. However, this result can be significantly reinforced through the use of redistribution policies as well as being a consequence of cultural processes inducing conformism.

More specifically, we observe that under the impact of legality framing, - a redistributive policy mechanism through which a part of the revenues are relocated from defectors to cooperators- and through the cultural process that induce conformism, participants with high empathy levels have a greater propensity for choosing the “legal” product. In this sense, our main findings show that the cooperative attitude of these participants increases significantly with each treatment we note that the proportion of individuals with a high level of empathy that choose product A is significantly higher than individuals with low empathy level (9 percent higher on average).

Therefore we can conclude that empathy has a significant effect on participants’ behavior and the choice they make between the two types of products. Moreover, we can state that empathy has a positive and strong impact on participants who decide to purchase a socially responsible product (which has a higher price and contributes positively to the public good of legality). Consistent with the literature on empathy, our findings suggest that the mechanism that we apply in our experiment can be useful in triggering altruism – a motivational state having the ultimate goal of increasing the other’s welfare. Our final conclusion is that empathy can be considered a good candidate to increase participants’ contribution to the public good.

References

- Andreoni, J. (1989). Giving With Impure Altruism: Applications To Charity And Ricardian Equivalence. *Journal of Political Economy* 97(6): 1447-1458.
- Andreoni, J. (1990). Impure Altruism And Donations To Public Goods: A Theory Of Warm-Glow Giving. *Economic Journal* 100(401): 464-477.
- Artinger, F., Exadaktylos, F., Koppel, H., Sääksvuori, L. (2014). In Other's Shoes: Do Individual Differences in Empathy and Theory of Mind Shape Social Preferences? *PLoS ONE*, 9 (4).
- Batson, C. D., & Shaw, L. L. (1991). Evidence For Altruism: Toward a Pluralism Of Prosocial Motives. *Psychological inquiry*, 2(2), 107-122.
- Batson, C. D. (2010). Empathy-Induced Altruistic Motivation. In M. Mikulincer & P. R. Shaver (Eds.), *Prosocial Motives, Emotions and Behavior: The Better Angels of Our Nature* Washington, D.C.: American Psychological Association 15–34.
- Becchetti, L., Salustri, F. (2015). The Vote with the Wallet as a Multiperson Prisoner's Dilemma, CEIS working paper n. 359.
- Bohnet, I., Zeckhauser, R. (2004). Trust, Risk and Betrayal. *Journal of Economic Behavior & Organization* 55(4): 467-484.
- Bolton, G. E., Ockenfels, A. (2000). ERC: A Theory Of Equity, Reciprocity, And Competition. *American Economic Review* 90(1):166-193.
- Carpenter, P., 2004. When In Rome: Conformity and the Provision of Public Goods. *The Journal of Socio-Economics* 33(4): 395-408.
- Charness, G., Rabin, M. (2002). Understanding Social Preferences with Simple Tests. *Quarterly Journal of Economics* 117(3): 817-869.
- Cialdini, R., Trost, M., (1998). Social Influence: Social Norms, Conformity, And Compliance., in: Gilbert, D., Fiske, S., Lindzey, G., (Eds.), *The Handbook of Social Psychology*. McGraw-Hill, Boston, pp. 151–192.
- Cox, J. C. (2004). How to Identify Trust and Reciprocity. *Games and Economic Behavior* 46(2): 260-281.
- Couture, T., and Gagnon, Y., (2010). An Analysis of Feed-In Tariff Remuneration Models: Implications for Renewable Energy Investment. *Energy policy*, 38(2), 955-965.
- Czap, V., Czap, J., Khachaturyan, M., Burbach, M. E., Czap, Lynne, G. D. (2013). Smiley or Frowney: The Effect of Emotions and Empathy Framing in a Downstream Water Pollution Game. *International Journal of Economics and Finance*, 5(3), 9.

- Czap, H. J., Czap, N. V., & Bonakdarian, E. (2010). Walk the talk? The Effect of Voting and Excludability in Public Goods Experiments. *Economics Research International*, 2010.
- Davis, M. H. (1983). Measuring Individual Differences in Empathy: Evidence for a Multidimensional Approach. *Journal of Personality and Social Psychology*, 44(1), 113-126
- De Waal, F., (2008). Putting the Altruism Back into Altruism: The Evolution of Empathy. *Annual Review of Psychology*., 59.
- European Parliament (2001). Directive 2001/77/EC of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market. (Downloadable: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32001L0077>)
- Fehr, E., Schmidt, K. M. (1999). A Theory of Fairness, Competition, and Cooperation. *Quarterly Journal of Economics* 114(3): 817-868.
- Fischbacher, U. (2007). z-Tree: Zurich Toolbox for Ready-Made Economic Experiments. *Experimental economics* 10(2): 171-178.
- Fischbacher, U., Gächter, S. (2010). Social Preferences, Beliefs, and the Dynamics of Free Riding in Public Good Experiments. *American Economic Review* 100(1): 541-556.
- Fischbacher, U., Gächter, S., Fehr, E. (2001). Are People Conditionally Cooperative? Evidence from a Public Goods Experiment. *Economics Letters* 71(3): 397-404.
- Italian Competition Authority. Boom of requests to Antitrust Authority to obtain the rating of legality - Press release. (Downloadable: <http://www.agcm.it/en/newsroom/press-releases/2196-boom-of-requests-to-antitrust-authority-to-obtain-the-rating-of-legality.html>)
- Kirman, A., Teschl, M. (2010). Selfish or selfless? The Role Of Empathy In Economics. *Philosophical Transactions of the Royal Society - B*, 356, 303-317.
- Klein, A., Held, A., Ragwitz, M., Resch, G., Faber, T. (2007). Evaluation of Different Feed-In Tariff Design Options: Best Practice Paper for The International Feed-In Cooperation. *Karlsruhe, Germany and Laxenburg, Austria: Fraunhofer Institut für Systemtechnik und Innovationsforschung and Vienna University of Technology Energy Economics Group*.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R. (1999). The Quality of Government. *Journal of Law, Economics, and Organization* 15(1): 222-279.
- Mendonça, M. (2009). *Feed-in tariffs: accelerating the deployment of renewable energy*. London, Routledge.
- Moscovici, S., 1985. Social Influence and Conformity, in: Gardner, L., Aronson, E., (Eds.), *The Handbook of Social Psychology*. Random House, New York.
- Rabin, M. (1993). Incorporating Fairness Into Game Theory and Economics. *American Economic Review* 91(4): 1281-1302.

Singer, T., Seymour, B., O'doherty, J., Kaube, H., Dolan, R. J., & Frith, C. D. (2004b). Empathy for Pain Involves the Affective but not Sensory Components of Pain. *Science*, 303(5661), 1157-1162.

Singer, T. and Fehr, E. (2005). The Neuroeconomics of Mind Reading and Empathy. *American Economic Review*. 95, 340–345.

Singer, T. (2006). The Neuronal Basis and Ontogeny of Empathy and Mind Reading: Review of Literature and Implications for Future Research. *Neuroscience & Biobehavioral Reviews*, 30(6), 855-863.

Appendix

Table 3.1 Definition of Variables used in the Econometric Estimates

Variable	Definition
Responsible choice	Dummy taking value 1 if the individual opts for product A, and 0 otherwise
Responsible choice (average)	Average share of individuals opting for product A in a given game round
Belief about A	Expected number of participants who will buy product A during a given game round
Base	Dummy taking value 1 for baseline sessions, and 0 otherwise
LegFrame	Dummy taking value 1 for legality framed sessions, and 0 otherwise
LegConfFrame	Dummy taking value 1 for legality framed sessions with conformity information design, and 0 otherwise
RedistributionBase	Dummy taking value 1 when the redistributive mechanism takes place in baseline sessions, and 0 otherwise
LegFrameRedistribution	Dummy taking value 1 when the redistributive mechanism takes place in legality framed sessions, and 0 otherwise
LegConfFrameRedistribution	Dummy taking value 1 when the redistributive mechanism takes place in session with conformity information design, and 0 otherwise
Round	Number of session round
Empathy	Empathy Score Interpersonal Reactivity Index (IRI)
Gender (male)	Dummy taking value 1 if the individual is a man, and 0 otherwise (according to question 1. of the questionnaire)
Age	Age according to question 2. of the questionnaire (in Appendix 4)
Living condition	Three dummies generated according to question 4. of the questionnaire (see Appendix 4)
Education (father's side)	Five dummies generated according to question 5. of the questionnaire (see Appendix 4)
Education (mother's side)	Five dummies generated according to question 6. of the questionnaire (see Appendix 4)
Employment status (father's side)	Ten dummies generated according to question 7. of the questionnaire (see Appendix 4)
Employment status (mother's side)	Ten dummies generated according to question 8. of the questionnaire (see Appendix 4)
Income level	Six dummies generated according to question 10. of the questionnaire (see Appendix 4)

Chapter 4

Gender Differences In Socially Responsible Consumption.

An Experimental Investigation

Abstract: We report on a simple experimental study designed to investigate the different gender attitudes towards socially responsible consumption. We use the Vote-with-the-Wallet Game, (VWG), a version of a repeated multipersonprisoner’s dilemma that mimics the characteristics of the choice between a conventional and a socially responsible product. More precisely we test the effect of three factors: two different frames and an ex-post redistribution mechanism that transfers resources from purely self-interested consumers to responsible ones. We find that women remain significantly more cooperative (choosing the responsible product more often) when the redistribution mechanism is interrupted and are significantly less satisfied with the behavior of the other players in that treatment.

Keywords: Responsible Consumption, Gender Differences, Social Preferences, Lab Experiment.

JEL Code: C92, C72, D03.

1. Introduction

Consumer research has established that women and men tend to have different consumption patterns (Costa 1994; Horowitz and Mohun 1998; Grover et al. 1999; Warde, 1997). In the OECD countries, for instance, women make more than 80 percent of household purchasing decisions and are more likely to buy basic goods (such as food, clothing and household items). Men, on the other hand, spend more than 80 percent of the household income and are more likely to buy more expensive goods (houses, cars, electronics, etc.) (OECD, 2008). Together with income, age and household size, gender is a key factor in determining consumer choices.

In this paper we consider a further element that may produce gender differences in consumption styles, that is, the sensitivity to social and/or environmental issues, and, as a consequence, a higher or lower willingness to pay more for socially and/or environmentally responsible products.

We study this phenomenon with a lab experiment by means of the “Vote-with-the-Wallet Game” (VWG) (Becchetti and Sallustri, 2015). The game is a multi-person “hybrid contribution-prisoners’ dilemma” (Arce and Sandler, 2005) that stylizes the increasingly frequent situation in which consumers face the choice between a socially responsible product and an alternative more conventional one.¹² What typically defines this case is a trade-off: the first product generally costs more (ie. organic, fair trade products are generally sold at premium due to the extra costs incurred by producers that incorporate the additional responsible characteristics in their productive process) but consumers (when adequately informed) know that, by “voting with the wallet” for it, they may contribute to a public good (generated by the same characteristics of the product plus a demand-driven stimulus for taking more socially and/or environmentally responsible corporate stance) in proportion to the market share of consumers that make the same choice.

We also investigate the effect of a redistribution mechanism studied by Becchetti, Pelligra and Sallustri (2015) in the experiment. This mechanism mimics a policy intervention intended to subsidize the responsible choice as it takes away part of the gains from the “defectors” (buyers of

¹² Boston Consulting group reports that organic, environmentally or socially responsible products accounted for at least 15 percent of all grocery sales in 2014 (BCG, 2014). Since the share of consumers actually choosing that kind of product is obviously a subset of those facing the alternative between the responsible and the conventional product, we may infer that the “vote with the wallet” game is played in much more than 15 percent of sales decisions.

the conventional product) and gives them to the “cooperators” (buyers of the responsible products). We introduce this treatment in the experiment because these types of policies are becoming more and more relevant as instruments to foster socially and environmentally consumption patterns. They have recently been introduced in around 63 countries under the form of environmental feed-in tariffs (redistributing away from consumers using conventional energy sources to consumers installing solar panels) but can be applied in similar ways in other fields ([Couture and Gagnon, 2010](#)). [Becchetti et al. \(2015\)](#) find that such a policy significantly increases the share of cooperative choices in equilibrium.

The questions of foremost importance that we propose to answer in this paper, whether gender differences matter in the VWG and matter for the redistribution policy. We, in fact, may provide an answer as to whether women or men have different preferences for the responsible consumption (in absolute or conditionally in different contexts of the experiment) and/or which of the two sexes is more potentially reactive to campaigns or policies in favour of social and environmental sustainability.

This paper also contributes to the large experimental literature that has, in recent years, gathered robust evidence about gender differences, mainly in three areas of investigation: attitude towards risk, response to incentives and competition and, finally, other-regarding behavior. We know now that women tend to be more risk-averse, and less sensitive to material incentives and to a competitive environment. With regard to social preferences we cannot in general affirm that men and women are different in terms of generosity or cooperativeness. Evidence on this point is, in fact, mixed. What can be said with a high degree of confidence is that women’s social preferences are more malleable than men’s, namely, that women’s behavior shows a higher sensitivity to the contextual conditions of the experiment (see [Croson and Gneezy, 2009](#), for a comprehensive survey).

The social preference literature studies when and how people’s choices are affected by other individuals’ well-being. Most experiments in this area consider participants’ behavior in simple economic games such as the Dictator Game (DG), the Ultimatum Game (UG), the Trust Game (TG) and the Prisoner’s Dilemma (PD). In experiments with the dictator game, for instance, women tend to give more than men ([Eckel and Grossman, 1998](#)); however when the same game is used in a less anonymous design, as in [Bolton and Katok \(1995\)](#) this difference disappears.

Summarising the findings from Dictator Games (DG), [Croson and Gneezy \(2009\)](#) conclude that men are more concerned with efficient allocations while women are more averse to inequality.

Results from Trust Game (TG) experiments are inconclusive as they show either no difference between the trusting behavior of men and women and find conflicting results for trustworthy and reciprocal behavior (Croson and Buchan 1999; Cox and Deck 2006; Bohnet 2007 among others), or that woman trust less (Eckel and Wilson 2004; Chaudhuri and Gangadharan 2007; Garbarino and Slonim 2009); Cox and Deck (2006), Eckel and Wilson (2004), Bohnet (2007) find no gender differences on trustworthiness and reciprocity, while Croson and Buchan (1999), Chaudhuri and Gangadharan (2007), Snijders and Keren and Buchan et al. (2008) find that men are more concerned about reciprocal behavior than women.

The most widely discussed game in experimental psychology and economics is certainly the prisoner's dilemma. Since the early studies based on this game (Rapoport and Chammah, 1965; Kahn, Hottes, and Davis, 1971; Sibley, Senn and Epanchin 1968; Tedeschi, Hiester and Gahagan 1969; Dawes, McTavish, and Shaklee 1977; Orbell, Dawes and Schwartz-Shea 1994) the evidence about the difference in the degree of cooperativeness between men and women has been mixed. The Prisoner's Dilemma (PD) has also been investigated in its multi-person version known as the Public Good (PG) game. Again the findings from this game are inconclusive: Brown-Kruse and Hummels (1993), Sell and Wilson (1991) and Solow and Kirkwood (2002) find higher levels of contribution for men. On the contrary Seguíno, Stevens and Lutz (1996) find that women contribute more, where as Sell et al. (1993), Cadsby and Maynes (1998) and Andreoni and Ragan Petrie (2008) find no significant differences in the levels of contribution by men and women. Summarizing we can affirm that the literature on gender differences in experiments does not find clear-cut differences in preferences related to altruism and cooperation but it highlights a higher sensitivity of women to the contextual factors of the experiment.

This paper contributes substantially to the literature as we focus on the VWG, a variant of the multi-person Prisoner's Dilemma (PD). This VWG has only been examined once before experimentally in the academic behavioural academic literature (Refer to the companion paper by Becchetti, Pelligra and Salustri (2015)). By introducing different frames, we can assess as well the proposition that there is differential context-sensitivity between the genders that Croson and Gneezy (2009) use to account for the evidence in their discussion of their findings.

The three main findings of our paper are:

- i) women are significantly more likely to maintain cooperative behavior (choice of the responsible product) after the redistributive mechanism is interrupted
- ii) women are significantly less satisfied with the behavior of other players in the game

- iii) the introduction of two frames, with different specifications for the socially responsible activities of the buyer, has no differential effect on men and women. In particular we find that such frames convince men to keep up with the levels of cooperation of women after the end of the redistribution mechanisms.

The paper is divided into four sections with an introduction and conclusion. The second section outlines the theoretical framework, while the third section describes the experimental design and the hypotheses to be tested and the fourth section presents empirical findings. The fifth section concludes.

2. The Model: “Vote-with-the-Wallet” Game.

The Vote-with-the-Wallet Game (VWG), introduced first by [Becchetti and Salustri \(2015\)](#), is a specific multi-person “hybrid contribution-prisoners’ dilemma” ([Arce and Sandler, 2005](#)). In its simplest form, the two-player variant, player’s utility is conditional on the choice of choosing the responsible product (vR) or voting for the conventional product (vC) and can be written as

$$U_i(S) = \begin{cases} \beta + \alpha - \gamma & \text{if } S = (vR, vR) \\ \frac{1}{2}\beta + \alpha - \gamma & \text{if } S = (vR, vC) \\ \frac{1}{2}\beta & \text{if } S = (vC, vR) \\ 0 & \text{if } S = (vC, vC) \end{cases}$$

were $S := (S^i, S^{-i}) \in \{vC, vR\}^2$ indicates the strategy profile.

The parameter $\beta \in [0, +\infty)$ measures the externality arising from the voting choice that induces corporations to a more social, environmental and fiscally responsible stance, the intensity of the effect depending on the share of players choosing the (vR) strategy. The parameter $\alpha \in [0, +\infty)$ measures the positive effect generated by the (vR) strategy, in case of players’ nonzero other-regarding preferences. The parameter $\gamma \in [0, +\infty)$ measures the cost differential between the vR

strategy (buying the socially responsible (SR) product) and the vC strategy (buying the equivalent non-SR product). Players are assumed as being not constrained by income in the game.¹³

As shown by [Becchetti and Salustri \(2015\)](#), with $G = (N, (S^i)_{i \in N}, (U_i)_{i \in N})$, $N = \{1, 2\}$ and $S^i = \{vR, vC\}$, the unique NE of the game is (vC, vC) if $\frac{1}{2}\beta + \alpha < \gamma$ and (vC, vC) otherwise, and we are in the PD area for intermediate values of γ where $\frac{1}{2}\beta + \alpha < \gamma < \beta + \alpha$. In this parametric interval the unique NE - (vC, vC) - is Pareto dominated by the strategy pair (vR, vR) .

In the multiperson version of the game $n > 2$, $G_n = (N, (S^i)_{i \in N}, (U_i)_{i \in N})$, $N = \{1, \dots, n\}$, and $S^i = \{vR, vC\}$ for each $i \in N$. The payoff function now becomes

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n}\beta + \alpha - \gamma & \text{if } S^i = vR \\ \frac{j}{n}\beta & \text{if } S^i = vC \end{cases}$$

where j measures the number of players choosing the vR strategy in S^{-i} . The multiperson game has (vC, vC) as a unique NE if $\frac{1}{n}\beta + \alpha < \gamma$ and (vR, vR) otherwise. What has to be noted is that a higher number of players clearly makes the PD region larger since the parametric interval of γ in which we are in presence of a PD is $(\frac{1}{n}\beta + \alpha, \alpha + \beta)$. This implies that, in global consumer and investor markets, the PD problem of the VWG is highly relevant.

3. Experimental Design

In this work we analyse data gathered in [Becchetti, Pelligra and Salustri \(2015\)](#). They investigate players' choices in a VWG with or without a redistribution mechanism that transfers money from defectors to cooperators. Each treatment considers two sequences, of 10 rounds each, of the VWG with and without redistribution, respectively. In each round a group of 10 players chooses between two goods named A and B: the first costs 10 tokens, the second 5 tokens. In each round players are given an endowment of 20 tokens. This version of the game is specifically designed to reproduce the main characteristics of the VWG, including the positive externality in purchasing the

¹³ Said in other terms this implies that only players without income constraints (income at least equal or above the full cost of the responsible product) can participate to the game.

responsible but more expensive product. For this reason there is a benefit of 3 tokens for each participant whenever a player chooses the more expensive product A (see Table A1 in the Appendix Experiment 3). The share of players choosing each product is the only information revealed to all players at the end of each round. The “redistribution phase” consists of a 10 round variant of the VWG where all players choosing product B are taxed of 2.5 points that is conveyed to a common fund. The collected points are then redistributed before the following round among players who have previously chosen the product A (see tables A3 and A4 in the Appendix Experiment 3). It comes about that the purchase of product A becomes the dominant strategy in the redistribution phase, whatever the number of cooperative players.

By applying the theoretical framework described in section 2 to the parametric case of our game without redistribution we find that $n = 10$, $\beta = 30$, $\gamma = 5$, and $\alpha = 0$ for simplicity. As a consequence the payoff function becomes¹⁴

$$U_i(S^i, S^{-i}) = \begin{cases} \frac{j+1}{n}\beta - \gamma & \text{if } S^i = vR \\ \frac{j}{n}\beta & \text{if } S^i = vC \end{cases}$$

$$= \begin{cases} \frac{j+1}{10}30 - 5 & \text{if } S^i = vR \\ \frac{j}{10}30 & \text{if } S^i = vC \end{cases}$$

with j being the number of players choosing the vR strategy in S^i . The multipersongame has (vC, vC) as a unique (inefficient) NE since $\frac{1}{n}\beta + \alpha < \gamma < \beta + \alpha$ (i.e. $3 < 5 < 30$).

It is easy to see that the experiment's payoffs structure involves the typical free-riding problem of the prisoner's dilemma, because the dominant strategy in the baseline treatment is represented by purchasing the cheaper but less responsible good B whatever the share of players choosing good A (see Table A2 in the Appendix experiment 3).

The experiment consists of two more treatments where the game is framed. The two products are itemized as two “electricity supply contracts” provided by a “socially responsible company” (good A) and a second unspecified company (product B). In the two frames, social responsibility is presented as concerning two different “areas of commitment”. Frame 1 sees the company's

¹⁴ Note that in our utility function we do not have the endowment since the parameters are expressed as differentials between the choice of the responsible product and the choice of the conventional product.

dedication to the local development of the economy, while Frame 2 describes the company's “pledge” to fund social innovations initiatives and projects on a national scale¹⁵. The idea behind these two versions of the game is to differentiate the possible indirect impact that players may have from the socially responsible activities of the company. The larger the distance the lower the potential benefit for the player. Each of the three treatments, baseline, frame 1 and frame 2 have been replicated by inverting the order of the phases, with the redistribution phase at the end or at the beginning (see Table A5 in the Appendix experiment 3).

The main findings of the companion paper of Becchetti et al. (2015) who analyze revealed choices in the experiment are: i) the non zero but declining share of cooperators in the base (framed and non framed) treatments; ii) the upward jump in the share of cooperators once the redistribution mechanism is introduced; iii) the positive effect of the frame on the share of cooperative choices in non-redistribution treatments.

3.1. Hypothesis Testing

In this paper we test a further related hypothesis. Let $C_{(i,t)}$ indicate the strategy selected by the i -th player in round t of game G , with $C \in \{vR, vC\}$ where vR (voting for/buying the responsible product) is the purchase of product A, while vC (voting for/buying the conventional product) is the purchase of good B, and $G \in \{\text{Base, Base Frame 1, Base Frame 2, Redistribution, Redistribution Frame 1, Redistribution Frame 2}\}$ indicates the specific treatment considered.

The null hypothesis tested is

$$H_0: E[C_{f,t}(G)] = E[C_{m,t}(G)]$$

where f are women and m men. That is, our null states that there are no gender differences in the share of cooperators in the specific treatment G .

3.2. Procedures

The experimental sessions took place at the University of Cagliari (Italy), in June 2015. We recruited 180 participants (90 females and 90 males), mainly students, from a wide range of disciplines. At their arrival in the lab, participants, ten per session, were randomly assigned, to a computer. General instructions were read aloud and subjects were informed that the experiment

¹⁵ See Experimental instructions in the Appendix 2 for a precise description of the frames.

consisted of two phases, but they received the specific instructions only for phase one. Questions about the structure of the game, the procedures and the payment rules were then answered privately. Once each participant completed the ten rounds of phase one, participants were given phase two instructions, which were read aloud. When the second phase ended all the participants completed a post-experimental questionnaire about their socio-demographic characteristics, general values and their attitudes about corporate social and environmental responsibility (see Appendix Experiment 3).

Each participant received the equivalent in cash (conversion rate 2 tokens = 1 euro) of the payoff obtained in one round randomly chosen among the twenty played plus 5 tokens as show-up fee. The sessions lasted approximately one hour and earnings averaged about 16 euros. The experiment was computerized using the software z-Tree platform (Fischbacher, 2007).

4. Results

4.1. Empirical Findings

Our findings document that the null is rejected only in one case, that is, in the base-treatment where the share of non-cooperative choices is 69.68 percent for women and 79.31 percent for men (χ^2 7.29, p-value 0.007). In all other treatments (Frame 1, Frame 2 and the redistribution treatments under Base, Frame 1 and Frame 2) we detect no significant gender differences. Note that this is actually two findings in one. First, women cooperate significantly more in the base treatment (the treatment without redistribution mechanism). Second, the introduction of responsibility frames in the base treatment bridges the gender gap, with men reaching the same level of cooperative choices than women.

To examine more in depth this finding we consider that it is clear from our design that the aggregate players' choices in the Base treatment actually correspond to two different sequences of the Base-Redistribution designs. In the first case players play 10 rounds under the Base treatment and the following 10 rounds (from the 11th to the 20th) under the Redistribution treatment. In the second case the sequence is inverted. When we analyse the gender result in the Base treatments between the Base-Redistribution and the Redistribution-Base sequences we find that the gender effect is concentrated on the second case with 85.3 percent non cooperative choices being made by men as against 67.3 percent non-cooperative choices being made by women (χ^2 13.45, p-value 0.000). Hence, we conclude that women are more likely to keep using the cooperative strategy after the redistribution mechanism is removed.

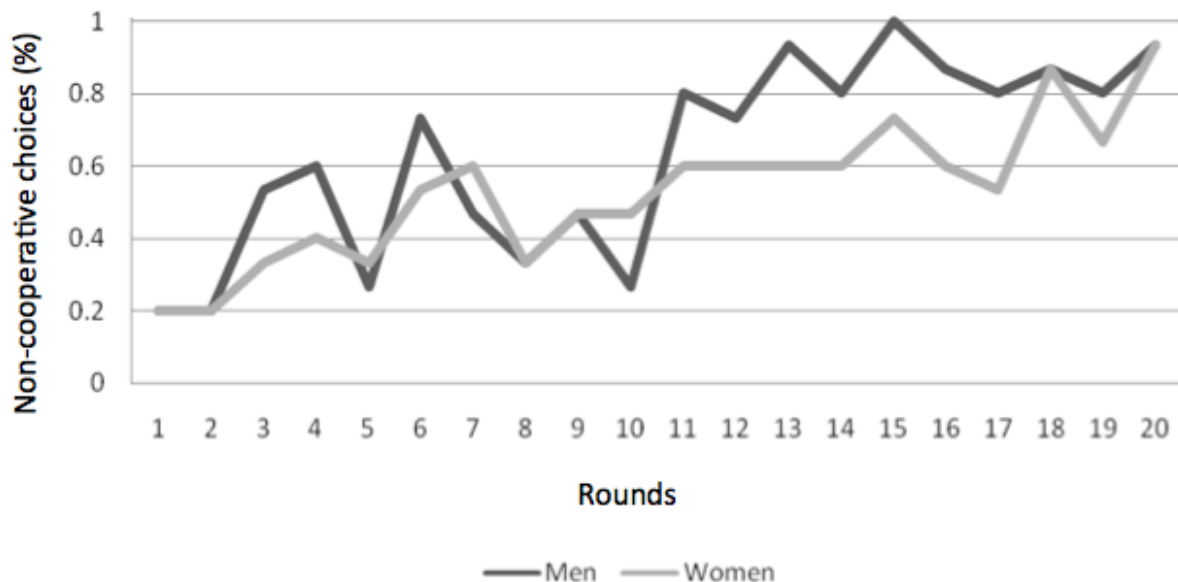
Table 1. Hypothesis testing

Treatment (men) vs (women)	Obs.	Share of non-cooperative choices (%) (1) vs (2)	χ^2	P- value
Base	600	79.31 vs 69.98	7.28	0.007
Base Frame 1	600	56.9 vs 60.71	0.908	0.341
Base Frame 2	600	53.4 vs 54.51	0.068	0.793
Redistribution	600	39.1 vs 41.43	0.428	0.513
Base (after Redistribution)	300	85.3 vs 67.3	13.45	0.000
Base (before Redistribution)	300	72.86 vs 77.31	0.036	0.85
Frame 1 (after) Redistribution	300	41.9 vs 28.8	4.88	0.027
Frame 2 (after) Redistribution	300	26.7 vs 38	1.59	0.20
Redistribution (after) Frame 1	300	36.9 vs 28.57	0.596	0.44
Redistribution (after) Frame 2	300	35.6 vs 35.62	1.41	0.23

Notes: for the definition of different treatments see Appendix 2:

When we look at the dynamics of men and women's choices in the redistribution+base design we clearly find evidence of what we tested (Figure 1). The averages of non cooperative choices for the two sexes overlap until the 10th round while there is a clear-cut difference after the removal of the redistribution mechanism (11th round) which lasts until the 18th round. More specifically, the men's change in the share of non-cooperative choice is much sharper as soon as the elimination of the redistribution mechanism is announced. This can be interpreted in two ways: i) since the shift in design makes the non cooperative choice the dominant strategy, men are more rational to adapt to it soon; ii) women are more resilient to the cooperative choice in the attempt to avoid the coordination failure implied by the prisoner's dilemma of the game.

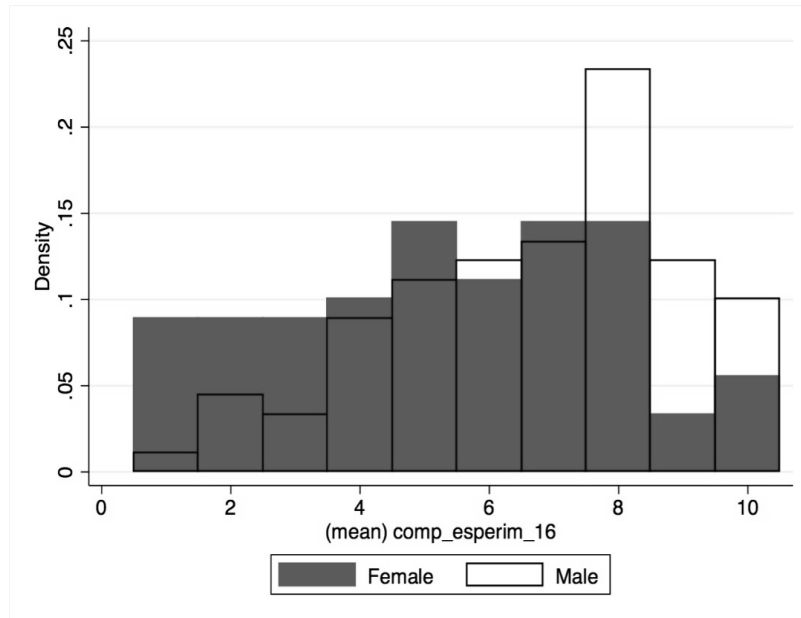
Figure 1. Dynamics of gendered non-cooperative choices in the Baseline+Redistribution Treatment



4.2. Satisfaction about the game

With our ex post survey we ask participants in the experiment about their satisfaction for the behavior of their fellow participants in the game. We find here another relevant difference between women and men (see Figure 2). The gender difference in the distribution of satisfaction for their fellow players' in the experiment is clear-cut. When looking at the right tail we find that less than 9 percent of women express a level of satisfaction above 7 against more than 45 percent of men. The difference on the left tail is strong as well: more than 36 percent of women express a satisfaction below 5, while this is the case for slightly less than 29 percent for men.

Figure 2 distribution of satisfaction for other players' behavior for men and women in the vote with the wallet game



Note: (mean)comp_esperim_16: average satisfaction with other players' behavior in the experiment (males vs females)

In order to check whether the observed difference remains significant once we control for relevant observable factors we estimate the following ordered logit base specification (Table 2 column 1)

$$Satisfaction_i = \beta_0 + \beta_1 PlayerNonCoopShare_i + \beta_2 AvgGroupNonCoopShare_i + \beta_3 Male_i + \beta_4 Age_i + \sum_j \delta_j DIncome_j + \varepsilon_i \quad (1)$$

where *Satisfaction* is a 0-10 variable measuring satisfaction for the behavior of other players in the game. The two variables measuring what happened in the game are *PlayerNonCoopShare* (the share of cooperative choices of the *i*-th player across the 20 rounds) and *AvgGroupNonCoopShare* (the share of cooperative choices of all the ten players across the 20 rounds). Socio-demographic controls such as a male gender dummy, age and five income dummies are added to the estimate.

Table 2. The gender effect in the determinants of satisfaction about other players' behavior

VARIABLES	(1)	(2)	(3)
Male	0.953*** (0.272)	0.929*** (0.273)	
PlayerNonCoopShare	3.216*** (0.631)	4.538*** (1.408)	3.548** (1.738)
AvgGroupNonCoopShare	-3.507** (1.534)	-10.326 (6.658)	-5.482 (8.370)
MaleBaseAfter			2.351** (1.080)
MaleBaseBefore			1.998* (1.082)
MaleFrameOneBefore			0.656 (0.945)
MaleFrameOneAfter			2.886** (1.154)
MaleFrameTwoBefore			2.022* (1.171)
MaleFrameTwoAfter			1.676 (1.054)
Age	-0.007 (0.042)	-0.003 (0.042)	-0.018 (0.044)
DIncome1	-0.290 (0.489)	-0.229 (0.494)	-0.138 (0.498)
DIncome2	-0.232 (0.504)	-0.169 (0.508)	-0.079 (0.515)
DIncome3	-0.529 (0.500)	-0.477 (0.504)	-0.344 (0.510)
DIncome4	-0.778 (0.590)	-0.721 (0.594)	-0.662 (0.593)
Profit		-0.222 (0.211)	-0.048 (0.273)
Constant cut1	-3.499*** (1.331)	-11.759 (7.958)	-5.679 (10.184)
Constant cut2	-2.503* (1.303)	-10.764 (7.953)	-4.678 (10.182)
Constant cut3	-1.956 (1.296)	-10.215 (7.949)	-4.124 (10.179)
Constant cut4	-1.333 (1.292)	-9.590 (7.945)	-3.494 (10.177)
Constant cut5	-0.680 (1.290)	-8.933 (7.941)	-2.834 (10.176)
Constant cut6	-0.134	-8.384	-2.277

	(1.291)	(7.938)	(10.176)
Constant cut7	0.556	-7.688	-1.574
	(1.294)	(7.932)	(10.174)
Constant cut8	1.772	-6.462	-0.333
	(1.303)	(7.923)	(10.169)
Constant cut9	2.618**	-5.614	0.522
	(1.317)	(7.922)	(10.168)
Observations	180	180	180

Notes: Male: (0/1) dummy for male gender, PlayerNonCoopShare: average share of player's non cooperative choice in the game; AvgGroupNonCoopShare: average share of group's non cooperative choice in the same player's session; MaleBaseAfter: (0/1) dummy for baseline treatment after redistribution treatment interacted with male dummy; MaleBaseBefore: (0/1) dummy for baseline treatment before redistribution treatment interacted with male dummy; MaleFrameOneAfter: (0/1) dummy for frame one treatment after redistribution treatment interacted with male dummy; MaleFrameOneBefore: (0/1) dummy for frame one treatment before redistribution treatment interacted with male dummy; MaleFrameTwoAfter: (0/1) dummy for frame two treatment after redistribution treatment interacted with male dummy; MaleFrameTwoBefore: (0/1) dummy for frame two treatment before redistribution treatment interacted with male dummy; Age: player's age; Dincome: income dummies for different yearly net income brackets (Dincome1 <15,000 euros; Dincome2 15,001-25,000 euros; Dincome3 25,001-35,000 euros; Dincome4 35,001-50,000 euros; omitted benchmark 50,001-90,000 euros); Profit: average player's profit per round.

Results presented in Table 3 show that men are significantly more satisfied about the behavior of other players than women. Note that in the regression we control for the share of one's own non cooperative choices (*PlayerNonCoopShare*) and for the average share of cooperative choices of other players in the experiment (*AvgGroupNonCoopShare*). In an augmented specification we as well calculate the average level of players' profits in each round (depending on the number of cooperators and on the presence/absence of the redistribution mechanism) (*Profit* variable) and find that the gender effect is robust to the inclusion of such variable (Table 2, column 2).

A likely interpretation linking this finding to that previously shown in section 4.1 is that women are significantly more disappointed than men for the incapacity of experiment mates of reaping the potential gains from a cooperative choice after the monetary incentive (the redistribution mechanism) is removed. This interpretation would be consistent with the observation of the significantly higher propensity to keep the cooperative strategy after the end of the redistribution mechanism.

Marginal effects calculated on the ordered logit estimate tells us that female gender reduces by around 20 percent the probability of declaring a level of satisfaction for other players' behavior

above 7. The econometric effect is smaller than the previously mentioned descriptive effect but still very relevant. Part of the descriptive effect is likely to be absorbed by the significant positive impact on satisfaction of one's own non cooperative choice. This variable suggests once again that the lack of satisfaction for other players' behavior is driven by their lack of support for the cooperative behavior followed by a given player.¹⁶

In a final robustness check we analyse the gender effect by separating each of the six different sequences of the game (Baseline plus Redistribution, Redistributionplus Baseline, Frame 1 plus Redistribution, Redistributionplus Frame 1, Frame 2 plus Redistribution, Redistributionplus Frame 2). Consistently with our interpretation of the nexus between the two results of the paper (that on experiment choices and on stated satisfaction) we find that the two sequences in which the gender effect is strongly significant are those where the redistribution effect comes first and the policy is suspended at the end of the 10th round (significance of *MaleBaseAfter* and *MaleFrameOneAfter* dummies in the specification of Table 2, column 3). This occurs both in the redistribution plus base sequence and in the redistribution plus frame one sequence.

It is important to note that gender differences in satisfaction about other players' behavior do not depend on different game circumstances since the average share of non-cooperative choices is 49.8 percent for men and 48.8 percent for women. As well the ratio between one's own average choices (1 if non cooperative and zero otherwise) and the average share of other players' non cooperative choices (our coefficient of betrayal aversion) is very close (31.8 against 31.0). This finding seems to show that after the initial different behavior when the redistribution ceases women adapt to other players' behavior in a sort of conditional cooperation attitude.

Note that a methodological problem which always emerges when using data that does not come from randomized experiments (hence our choice of combining data from randomized experiments and stated preferences) is endogeneity. In our case the problem obviously does not apply since we are looking at gender differences and therefore at a variable which cannot be caused by a third omitted drivers.

¹⁶In a sense, since cooperation is a joint endeavor, this disappointment is similar to that of the individuals who come to a social meeting and do not find the other invited participants. With reference to a well known say, if "it takes two to make tango" and it takes more than two to make the vote with the wallet game". In this perspective our findings seem to register the disappointment of the mate who is willing to "dance" for the others who do not participate to the game itself.

5. Conclusions

The literature on gender differences in experiments does not find clear-cut differences in preferences related to altruism and cooperation. It however concludes that many specific gender differences can be found related to specific game contexts. We analyze a specific game context that is becoming more and more relevant in our days. The game outlines the dilemma of choosing between a more expensive product advertised as incorporating more environmental and social responsibility and a cheaper alternative conventional product of equivalent quality. We model the choice under the form of a hybrid contribution multiperson Prisoner's Dilemma (PD) which we call the "Vote with the Wallet Game". Our findings confirm that gender differences exist conditionally related to specific game circumstances. More specifically, women are not more cooperative in absolute terms but are significantly more likely to keep cooperative behavior even when the incentive to follow it (the redistribution mechanism taxing defectors and subsidizing cooperators) ceases. As far as the game continues however, if they find that other players do not follow they then adapt consistently with the conditional cooperation principle. They however remain significantly more disappointed with the other players' behavior in the game, and especially so in those treatments where the redistribution mechanism is operated first and then disconnected, that is, in the same treatments in which the gender difference in cooperative choices is significant.

A policy suggestion stemming from our experiment (which requires further testing to see whether our findings are robust or sample specific) is that gender effects are relevant when evaluating the persistence of responsible/cooperative behavior once the economic incentives supporting it have been removed.

References

- Andreoni, J., Petrie, R., (2008). “Beauty, Gender and Stereotypes: Evidence from Laboratory Experiments.” *Journal of Economic Psychology*, 29(1): 73–93.
- Arce, D.G., Sandler, T., (2005). “The dilemma of the prisoner’ dilemma”, *Kyklos*, Wiley Blackwell, 58(1), 3-24.
- Becchetti, L., Pelligra, V., Salustri F., (2015). “The Impact of Redistribution Mechanisms in the Vote with the Wallet Game: Experimental Results.” CEIS Tor Vergata RESEARCH PAPER SERIES Vol. 13, Issue 8, No. 354.
- Becchetti, L., Salustri F., (2015). “The Vote With the Wallet as a MultipersonPrisoner’s Dilemma.” AICCON Working Papers no. 94.
- Bohnet, I., (2007). “Why Women and Men Trust Others.” In *Economics and Psychology: A Promising New Cross-Disciplinary Field*, ed. Bruno S. Frey and Alois Stutzer, 89–110. Cambridge and London: MIT Press.
- Bolton, G.E., Katok, E., (1995). “An Experimental Test for Gender Differences in Beneficent Behavior.” *Economics Letters*, 48(3–4): 287–92.
- Brown-Kruse, J., Hummels, D., (1993). “Gender Effects in Laboratory Public Goods Contribution: Do Individuals Put Their Money Where Their Mouth Is?” *Journal of Economic Behavior and Organization*, 22(3): 255–67.
- Buchan, N.R., Croson, R., Solnick, S.J., (2008). “Trust and Gender: An Examination of Behavior and Beliefs in the Investment Game.” *Journal of Economic Behavior and Organization*, 68(3–4): 466–76.
- The Boston Consulting Group (2014). “When Social Responsibility Leads to Growth: An Imperative for Consumer Companies to Go Green”, downloadable at <http://us5.campaign-archive2.com/?u=a102a1f840f67f04e25a7fc97&id=b8f2d07db0>.
- Cadsby, C.B., Maynes, E., (1998). “Gender and Free Riding in a Threshold Public Goods Game: Experimental Evidence.” *Journal of Economic Behavior and Organization*, 34(4): 603–20.
- Chaudhuri, A., Gangadharan, L., (2007). “An Experimental Analysis of Trust and

Trustworthiness.” *Southern Economic Journal*, 73(4): 959–85.

Costa, J., (1994). *Gender Issues and Consumer Behaviour*. Sage Publications, London.

Couture, T. and Gagnon, Y. (2010), “An analysis of feed-in tariff remuneration models: implications for renewable energy investment”, *Energy Policy*, 38(2): 955-965.

Cox, J.C., Deck, C.A., (2006). “When Are Women More Generous than Men?” *Economic Inquiry*, 44(4): 587–98.

Croson, R., Buchan, N.R., (1999). “Gender and Culture: International Experimental Evidence from Trust Games.” *American Economic Review*, 89(2): 386–91.

Croson, R., Gneezy, U., (2009). “Gender Differences in Preferences”, *Journal of Economic Literature* 47(2): 1–27.

Dawes, R.M., McTavish, J., Shaklee, E., (1977). “Behavior, Communication, and Assumptions about Other People’s Behavior in a Commons Dilemma Situation.” *Journal of Personality and Social Psychology*, 35(1): 1–11.

Eckel, C.C., Grossman, P.J., (1998). “Are Women Less Selfish than Men? Evidence from Dictator Experiments.” *Economic Journal*, 108(448): 726–35.

Eckel, C.C., Wilson, R.K., (2004). “Whom to Trust? Choice of Partner in a Trust Game.” Unpublished.

Garbarino, E., Slonim, R., (2009). “The Robustness of Trust and Reciprocity across a Heterogeneous U.S. Population.” *Journal of Economic Behavior and Organization*, 69(3): 226–40.

Grover, S., Hemmati, M., Flenley, C., (1999). *Gender and Sustainable Consumption. Bringing Policy Gaps in the Context of Chapter 4, Agenda 21 ‘Changing Consumption and Production Patterns’*. Report submitted to CSD-7.

Horowitz, Roger/Arwen Mohun (eds.) (1998): *His & Hers. Gender, Consumption and Technology*. University Press of Virginia.

Kahn, A., Hottes, J., Davis, W., (1971). “Cooperation and Optimal Responding in the Prisoner’s Dilemma Game: Effects of Sex and Physical Attractiveness.” *Journal of Personality and*

Social Psychology, 17(3): 267–79.

OECD, (2008). *Promoting Sustainable Consumption. Good Practices in OECD Countries.* www.oecd.org/dataoecd/1/59/40317373.pdf.

Orbell, J., Dawes, R.M., Schwartz-Shea, P., (1994). “Trust, Social Categories, and Individuals: The Case of Gender.” *Motivation and Emotion*, 18(2): 109–28.

Rapoport, A., Chammah A., M., (1965). “Sex Differences in Factors Contributing to the Level of Cooperation in the Prisoner’s Dilemma Game.” *Journal of Personality and Social Psychology*, 2(6): 831–38.

Seguino, S., Stevens, T., Lutz, M.A., (1996). “Gender and Cooperative Behavior: Economic Man Rides Alone.” *Feminist Economics*, 2(1): 1–21.

Sell, J., Wilson, R.K., (1991). “Levels of Information and Contributions to Public Goods.” *Social Forces*, 70(1): 107–24.

Sell, J., Griffith, W.I., Wilson, R.K., (1993). “Are Women More Cooperative than Men in Social Dilemmas?” *Social Psychology Quarterly*, 56(3): 211–22.

Sibley, S., Senn, S., Epanchin, A., (1968). “Race and Sex of Adolescents and Cooperation in a Mixed-Motive Game.” *Psychonomic Science*, 13: 123–24.

Snijders, C., Keren, G., (2001). “Do You Trust? Whom Do You Trust? When Do You Trust?” *Advances in Group Processes*, 18: 129–60.

Solow, J.L., Kirkwood, N., (2002). “Group Identity and Gender in Public Goods Experiments.” *Journal of Economic Behavior and Organization*, 48(4): 403–12.

Tedeschi, J.T., Hiester, D., Gahagan, J.; (1969). “Trust and the Prisoner’s Dilemma Game.” *Journal of Social Psychology*, 79(40): 43–50.

Warde. A., (1997). *Consumption, Food and Taste*. London: Sage.

LIST OF ABBREVIATIONS AND GLOSSARY

ABBREVIATION		EXPLANATION
BES	=>	Basic Empathy Scale
DG	=>	Dictator Game
EA	=>	Empathy Affective
EC	=>	Empathy Cognitive
ECU	=>	Experimental currency units
EQ	=>	Empathy Quotient
fMRI	=>	Functional Magnetic Resonance Imaging
GG	=>	Guessing Game
GT	=>	Game theory
H	=>	High Empathy
IRI	=>	Interpersonal Reactivity Index
L	=>	Low Empathy
MET	=>	Multifaceted Empathy Test
PD	=>	Prisoner's Dilemma
PET	=>	Position Emission Tomography
PGG	=>	Public Good Game
QSR	=>	Quadratic Scoring Rule
TG	=>	Trust Game
ToM	=>	Theory of Mind
UG	=>	Ultimatum Game
VWW	=>	Vote with the Wallet

GLOSSARY

Dictator Game (DG) In this game are two players the “the proposer” has an endowment of money to divide between himself and “the recipient”. But the recipient has no decision to make; she/he can only accept the offer.

Ultimatum Game (UG) two players are allocated a sum of money (the pie) that can be divided between them. The proposer makes an offer to the responder of how the money will be divided, which the responder accepts or rejects. If the second player accepts, the money is split according to the proposal. If the offer is rejected, neither player receives any money.

Trust Game (TG) – Invest Game (IG)

The trust game is similar to the dictator game, but with an added first step. In the trust game, one participant first decides how much of an endowment to give to the second participant, and this amount is multiplied by three. Then the second participant (now acting as a dictator) decides how much of this increased endowment to allocate to the first participant.

Prisoner’s Dilemma (PD)

The prisoner's dilemma is a scenario in which the outcome of one person’s decision is determined by the simultaneous decisions of the other participants, resulting in a good outcome for all of them if all act in cooperative way or in bad outcome if all act in their own self-interest.

Guessing Game (GG)

This is a proper game in order to understand how a player’s mental processing incorporates the thinking process of others. There are “n” players that have to choose a number between 0 to 100. The winner is the person whose number is closest to $2/3$ times the average of all chosen number.

Public Good Game (PGG)

In this game, participants secretly choose how many of their Experimental Currency Units (ECU) to put into a public pot. The ECU in this pot are multiplied by a factor (greater than one and less than the number of players, N) and this “public good” payoff is evenly divided among players. Each participant also keeps the ECU they do not contribute.

Deception game

A simple two-player game where the second player makes a decision, option A or option B, that determines the payoffs for both players, but the first player knows the payoffs for both options and has the moral decision to tell the second player which payoff is better for the second person. Varying the difference in payoffs identifies how much people are willing to deceive.

Battle of sexes game

In this game the players want to cooperate with each other, but they disagree about the best outcome for the game.

Two friends want to meet but disagree on the venue. One prefers to watching boxing while the other prefers ballet. However, if they show up at different sites, they will be unhappy without the other. the best choice for the two friends is to both play the same game since neither of them will be happy without the other.

Appendix Chapter 2: Tables and Lab Instructions

Table A. 1: Dictator Game Amount Sent (OLS Estimate)

VARIABLES	(1) DG	(2) DG	(3) DG	(4) DG	(5) DG	(6) DG	(7) DG	(8) DG	(9) DG	(10) DG	(11) DG	(12) DG	(13) DG	(14) DG	(15) DG	(16) DG
Avg-Empathy-BES	7.615*		4.562	-4.711												
	(4.249)		(4.831)	(6.850)												
Female		7.747**	5.762	-62.490*		5.347	-42.457	-47.934		3.064	-67.521*		3.581		7.032*	-24.584
		(3.838)	(4.377)	(36.359)		(4.416)	(35.328)	(32.214)		(4.176)	(40.635)		(4.244)		(4.077)	(17.108)
Bes X Female				0.908*				1.378*								
				(0.480)				(0.791)								
Cognitive Empathy BES					-0.081	-0.150	-0.613									
					(0.539)	(0.541)	(0.712)									
Affective Empathy BES					0.647*	0.463		-0.178								
					(0.356)	(0.386)		(0.467)								
BES Cognitive x Female							1.390	-1.422								
							(0.978)	(1.347)								
Avg-Empathy-IRI									17.062***	15.168**	3.062					
									(5.306)	(5.909)	(9.079)					
IRI x Female											0.752*					
											(0.431)					
Fantasy (IRI)												0.863*	0.819*			
												(0.454)	(0.457)			
Perspective Taking (IRI)												-0.114	-0.236			
												(0.594)	(0.612)			
Empathic Concern (IRI)												0.716	0.648			
												(0.554)	(0.560)			
Personal Distress (IRI)												0.616	0.487			
												(0.458)	(0.483)			
Avg-Empathy-EQ														9.258	4.471	-19.323
														(8.002)	(8.412)	(15.030)
EQ x Female																0.854*
																(0.449)
Experience	-3.474	-3.732	-3.538	-3.944	-3.241	-3.338	-3.788	-3.843	-3.289	-3.306	-4.426	-2.488	-2.468	-3.843	-3.741	-3.985
	(3.790)	(3.773)	(3.780)	(3.748)	(3.801)	(3.795)	(3.772)	(3.762)	(3.690)	(3.697)	(3.723)	(3.749)	(3.753)	(3.812)	(3.783)	(3.747)
Age	0.205	0.228	0.243	0.150	0.220	0.253	0.213	0.133	0.175	0.204	0.165	0.198	0.238	0.144	0.219	0.215
	(0.298)	(0.298)	(0.298)	(0.299)	(0.298)	(0.299)	(0.298)	(0.303)	(0.288)	(0.292)	(0.290)	(0.293)	(0.297)	(0.298)	(0.299)	(0.296)
Risk Attitude	0.030	0.110	0.098	0.154	0.031	0.094	0.132	0.152	-0.013	0.030	-0.034	-0.034	0.021	-0.004	0.096	0.099
	(0.500)	(0.501)	(0.502)	(0.498)	(0.501)	(0.502)	(0.501)	(0.498)	(0.487)	(0.492)	(0.489)	(0.492)	(0.496)	(0.504)	(0.503)	(0.498)
GQD	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.002	-0.003	-0.003*	-0.002	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-1.443	22.030**	5.653	40.678	4.216	9.911	43.578*	30.878	-29.265	-25.493	15.053	-21.392	-16.305	20.126*	18.470*	39.356**
	(18.672)	(8.655)	(19.383)	(26.673)	(19.645)	(20.165)	(26.236)	(20.132)	(19.666)	(20.361)	(30.776)	(20.752)	(21.633)	(11.004)	(10.962)	(15.439)
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
R-squared	0.040	0.046	0.053	0.079	0.046	0.057	0.062	0.084	0.089	0.093	0.114	0.104	0.109	0.026	0.048	0.075

Dummy female=1 and male=0; Iri/Bes/Eq xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Table A.2: Ultimatum Game Amount Sent by Proposers (OLS Estimate)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A	UG_A
Avg-Empathy-BES	-1.474 (2.072)		0.780 (2.310)	-1.070 (3.309)										
Female		-4.071** (1.852)	-4.401** (2.100)	-18.173 (17.734)		-4.277** (2.119)		-4.136** (2.039)	-19.221 (20.212)		-4.257** (2.088)		-4.701** (1.954)	-16.504** (8.216)
Bes X Female				0.184 (0.235)										
Cognitive Empathy BES					0.104 (0.260)	0.160 (0.258)								
Affective Empathy BES					-0.178 (0.174)	-0.037 (0.185)								
BES Cognitive x Female							-2.230 (2.726)	0.229 (2.953)	-2.284 (4.469)					
Avg-Empathy-IRI										0.161 (0.215)				
IRI x Female										-0.125 (0.229)	-0.078 (0.227)			
Fantasy (IRI)										0.019 (0.295)	0.164 (0.300)			
Perspective Taking (IRI)										-0.054 (0.277)	0.021 (0.276)			
Empathic Concern (IRI)										-0.141 (0.229)	0.007 (0.238)			
Personal Distress (IRI)												0.983 (3.852)	4.042 (3.989)	-4.850 (7.206)
Avg-Empathy-EQ														0.321 (0.217)
Experience	3.475* (1.831)	3.531* (1.799)	3.560* (1.808)	3.458* (1.815)	3.394* (1.838)	3.501* (1.816)	3.494* (1.829)	3.535* (1.807)	3.279* (1.842)	3.371* (1.868)	3.364* (1.844)	3.525* (1.833)	3.516* (1.799)	3.385* (1.793)
Age	0.067 (0.144)	0.034 (0.142)	0.037 (0.143)	0.019 (0.144)	0.061 (0.144)	0.033 (0.143)	0.075 (0.143)	0.034 (0.142)	0.027 (0.143)	0.073 (0.146)	0.025 (0.146)	0.080 (0.143)	0.027 (0.142)	0.027 (0.141)
Risk Attitude	0.482** (0.241)	0.432* (0.238)	0.430* (0.239)	0.442* (0.240)	0.482** (0.241)	0.431* (0.240)	0.489** (0.241)	0.431* (0.240)	0.417* (0.241)	0.499** (0.244)	0.434* (0.244)	0.486** (0.241)	0.419* (0.239)	0.421* (0.237)
GQD	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
DG	0.278*** (0.043)	0.289*** (0.042)	0.288*** (0.042)	0.282*** (0.043)	0.280*** (0.043)	0.289*** (0.043)	0.283*** (0.044)	0.288*** (0.043)	0.283*** (0.044)	0.285*** (0.044)	0.292*** (0.044)	0.272*** (0.042)	0.287*** (0.042)	0.277*** (0.042)
Constant	29.734*** (8.991)	27.104*** (4.215)	24.329*** (9.241)	31.445*** (12.978)	27.546*** (9.472)	22.952** (9.632)	31.326*** (9.801)	26.402*** (9.982)	34.947** (15.158)	30.485*** (10.366)	24.584** (10.638)	23.131*** (5.338)	23.931*** (5.251)	31.970*** (7.542)
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134
R-squared	0.286	0.309	0.310	0.313	0.289	0.311	0.287	0.309	0.312	0.289	0.312	0.283	0.315	0.327

Dummy female=1 and male=0; IRI/BES/xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Table A.3: Minimum Acceptable Offers (MAO) in the Ultimatum Game (OLS Estimate)

VARIABLES	(1) MAO	(2) MAO	(3) MAO	(4) MAO	(5) MAO	(6) MAO	(7) MAO	(8) MAO	(9) MAO	(10) MAO	(11) MAO	(12) MAO	(13) MAO	(14) MAO
Avg-Empathy-BES	0.424 (0.291)		0.339 (0.328)	0.295 (0.482)										
Female		0.308 (0.263)	0.167 (0.296)	-0.149 (2.542)		0.211 (0.298)		0.344 (0.290)	-0.844 (2.862)		0.299 (0.290)		0.276 (0.278)	1.195 (1.173)
Bes X Female				0.004 (0.034)										
Cognitive Empathy BES					0.058 (0.036)	0.056 (0.036)								
Affective Empathy BES					-0.001 (0.024)	-0.008 (0.026)								
BES Cognitive x Female							0.079 (0.379)	-0.127 (0.416)	-0.327 (0.636)					
Avg-Empathy-IRI									0.013 (0.030)					
IRI x Female										0.027 (0.031)	0.024 (0.031)			
Fantasy (IRI)										0.078* (0.040)	0.068 (0.041)			
Perspective Taking (IRI)										-0.082** (0.038)	-0.087** (0.038)			
Empathic Concern (IRI)										0.030 (0.031)	0.020 (0.033)			
Personal Distress (IRI)												0.379 (0.534)	0.203 (0.563)	0.899 (1.031)
Avg-Empathy-EQ														-0.025 (0.031)
Experience	-0.201 (0.255)	-0.218 (0.255)	-0.202 (0.255)	-0.205 (0.257)	-0.219 (0.255)	-0.223 (0.255)	-0.223 (0.256)	-0.220 (0.261)	-0.240 (0.255)	-0.275 (0.255)	-0.270 (0.255)	-0.224 (0.256)	-0.219 (0.256)	-0.207 (0.257)
Age	-0.030 (0.020)	-0.030 (0.020)	-0.029 (0.020)	-0.029 (0.020)	-0.031 (0.020)	-0.030 (0.020)	-0.033* (0.020)	-0.030 (0.020)	-0.030 (0.020)	-0.034* (0.020)	-0.030 (0.020)	-0.033* (0.020)	-0.030 (0.020)	-0.030 (0.020)
Risk Attitude	0.000 (0.033)	0.004 (0.034)	0.002 (0.034)	0.003 (0.034)	0.000 (0.033)	0.003 (0.034)	-0.000 (0.034)	0.004 (0.034)	0.003 (0.034)	-0.001 (0.033)	0.003 (0.034)	-0.001 (0.034)	0.003 (0.034)	0.002 (0.034)
GQD	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
DG	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)	0.000 (0.006)	-0.000 (0.006)	-0.001 (0.006)	0.001 (0.006)	0.001 (0.006)	0.000 (0.006)	-0.001 (0.006)	0.000 (0.006)
Constant	6.497*** (1.264)	7.915*** (0.595)	6.700*** (1.318)	6.871*** (1.898)	6.065*** (1.319)	6.289*** (1.358)	7.895*** (1.364)	8.301*** (1.404)	8.981*** (2.152)	7.152*** (1.407)	7.561*** (1.461)	7.809*** (0.742)	7.755*** (0.744)	7.123*** (1.081)
Observations	132	132	132	132	132	132	132	132	132	132	132	132	132	132
R-squared	0.048	0.042	0.051	0.051	0.058	0.062	0.032	0.043	0.044	0.082	0.090	0.036	0.043	0.048

Dummy female=1 and male=0; IRI/BES/xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Table A.4: Trust Game Amount Sent by Proposers (OLS Estimate)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A	TG_A
Avg-Empathy-BES	-4.104 (3.241)		1.327 (3.526)	3.767 (5.053)										
Female		-10.043*** (2.827)	-10.605*** (3.206)	7.559 (27.085)		-10.556*** (3.238)		-8.981*** (3.104)	-10.443 (30.840)		-9.624*** (3.152)		-8.827*** (2.975)	-8.940 (12.620)
Bes X Female				-0.242 (0.358)										
Cognitive Empathy BES					-0.024 (0.407)	0.114 (0.395)								
Affective Empathy BES					-0.311 (0.272)	0.036 (0.283)								
BES Cognitive x Female							-9.088** (4.217)	-3.747 (4.496)	-3.991 (6.820)					
Avg-Empathy-IRI									0.016 (0.327)					
IRI x Female										-0.501 (0.352)	-0.396 (0.343)			
Fantasy (IRI)										0.179 (0.455)	0.506 (0.453)			
Perspective Taking (IRI)										-0.444 (0.427)	-0.273 (0.417)			
Empathic Concern (IRI)										-0.285 (0.353)	0.051 (0.359)			
Personal Distress (IRI)												-13.537** (5.933)	-7.795 (6.075)	-7.880 (11.069)
Avg-Empathy-EQ														0.003 (0.333)
Experience	2.312 (2.864)	2.468 (2.747)	2.517 (2.759)	2.651 (2.772)	2.229 (2.878)	2.494 (2.775)	2.318 (2.829)	2.408 (2.751)	2.383 (2.811)	1.807 (2.876)	1.790 (2.784)	2.515 (2.823)	2.498 (2.740)	2.497 (2.754)
Age	-0.389* (0.225)	-0.467** (0.216)	-0.463** (0.218)	-0.440** (0.221)	-0.395* (0.226)	-0.464** (0.219)	-0.376* (0.221)	-0.464** (0.217)	-0.465** (0.218)	-0.396* (0.224)	-0.506** (0.220)	-0.355 (0.220)	-0.454** (0.216)	-0.454** (0.217)
Risk Attitude	0.605 (0.377)	0.483 (0.364)	0.480 (0.365)	0.464 (0.367)	0.605 (0.378)	0.480 (0.366)	0.628* (0.372)	0.502 (0.365)	0.501 (0.367)	0.637* (0.376)	0.490 (0.368)	0.633* (0.372)	0.509 (0.363)	0.509 (0.365)
GQD	0.000 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)
DG	0.078 (0.067)	0.105 (0.064)	0.103 (0.065)	0.110* (0.066)	0.081 (0.067)	0.103 (0.065)	0.105 (0.068)	0.117* (0.066)	0.117* (0.067)	0.115* (0.068)	0.131* (0.066)	0.080 (0.065)	0.109* (0.064)	0.109* (0.065)
Constant	41.220*** (14.065)	32.917*** (6.434)	28.198** (14.105)	18.813 (19.821)	38.993*** (14.836)	27.656* (14.717)	55.081*** (15.162)	44.389*** (15.197)	45.217* (23.128)	49.701*** (15.960)	36.357** (16.056)	37.537*** (8.221)	39.038*** (7.996)	39.114*** (11.585)
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134
R-squared	0.062	0.136	0.137	0.140	0.064	0.137	0.084	0.141	0.141	0.095	0.159	0.087	0.147	0.147

Dummy female=1 and male=0; IRI/BES/xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Table A.5: Trust Game Amount Average Returned by Proposers (OLS Estimate)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
AVG Back Share	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	TG-B	
Avg-Empathy-BES	0.001 (0.024)		0.009 (0.028)	0.061 (0.039)													
Female		-0.012 (0.022)	-0.015 (0.025)	0.368* (0.209)		-0.017 (0.025)	0.048 (0.216)	0.201 (0.174)		-0.014 (0.024)	0.370 (0.239)		-0.017 (0.025)		-0.009 (0.023)	0.119 (0.099)	
Bes X Female				-0.005* (0.003)													
Cognitive Empathy BES					-0.002 (0.003)	-0.002 (0.003)	0.000 (0.004)										
Affective Empathy BES					0.001 (0.002)	0.002 (0.002)		0.004 (0.003)									
BES Cognitive x Female								-0.001 (0.006)									
Avg-Empathy-IRI								-0.005 (0.004)									
IRI x Female									-0.001 (0.032)	0.007 (0.035)	0.071 (0.053)						
Fantasy (IRI)																-0.004 (0.003)	
Perspective Taking (IRI)													-0.003 (0.003)	-0.003 (0.003)			
Empathic Concern (IRI)													0.001 (0.003)	0.002 (0.004)			
Personal Distress (IRI)													0.002 (0.003)	0.002 (0.003)			
Avg-Empathy-EQ													0.000 (0.003)	0.001 (0.003)			
Experience															-0.021 (0.045)	-0.015 (0.048)	0.082 (0.086)
Age																	-0.003 (0.003)
Experience	-0.035 (0.022)	-0.035 (0.021)	-0.034 (0.022)	-0.031 (0.021)	-0.034 (0.022)	-0.033 (0.022)	-0.043* (0.023)	-0.039* (0.023)	-0.035 (0.022)	-0.034 (0.022)	-0.028 (0.022)	-0.036* (0.022)	-0.036* (0.022)	-0.034 (0.021)	-0.034 (0.022)	-0.033 (0.022)	
Age	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.002 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)	
Risk Attitude	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	
GQD	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	
DG	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	
Constant	0.120 (0.106)	0.134*** (0.050)	0.102 (0.110)	-0.097 (0.153)	0.143 (0.111)	0.124 (0.115)	0.171 (0.160)	0.007 (0.123)	0.128 (0.115)	0.112 (0.119)	-0.105 (0.180)	0.109 (0.121)	0.085 (0.126)	0.144** (0.063)	0.145** (0.063)	0.058 (0.091)	
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	
R-squared	0.168	0.170	0.171	0.193	0.171	0.174	0.045	0.064	0.168	0.170	0.187	0.177	0.180	0.170	0.171	0.183	

Dummy female=1 and male=0; **IRI/BES/xFemale**=Interaction Empathy Test*Female; **P-value:** *** p < 0.01, ** p < 0.05, * p < 0.1. **Standard Error in Parenthesis**

Table A.6: Prisoner Dilemma Share of Defectors (OLS Estimate)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD	PD
Avg-Empathy-BES	0.119 (0.097)		0.161 (0.110)	0.016 (0.157)										
Female		-0.014 (0.089)	-0.083 (0.100)	-1.164 (0.840)		-0.072 (0.101)		-0.004 (0.098)	-0.406 (0.971)		0.000 (0.099)		0.001 (0.094)	-0.210 (0.398)
Bes X Female				0.014 (0.011)										
Cognitive Empathy BES					0.017 (0.012)	0.018 (0.012)								
Affective Empathy BES					-0.001 (0.008)	0.002 (0.009)								
BES Cognitive x Female							-0.040 (0.129)	-0.038 (0.142)	-0.105 (0.215)					
Avg-Empathy-IRI									0.004 (0.010)					
IRI x Female										0.004 (0.011)	0.004 (0.011)			
Fantasy (IRI)										-0.016 (0.014)	-0.016 (0.014)			
Perspective Taking (IRI)										-0.002 (0.013)	-0.002 (0.013)			
Empathic Concern (IRI)										0.004 (0.011)	0.004 (0.011)			
Personal Distress (IRI)												-0.100 (0.181)	-0.101 (0.192)	-0.260 (0.349)
Avg-Empathy-EQ														0.006 (0.011)
Experience	-0.054 (0.086)	-0.058 (0.086)	-0.052 (0.086)	-0.060 (0.086)	-0.059 (0.086)	-0.057 (0.086)	-0.059 (0.086)	-0.059 (0.087)	-0.065 (0.088)	-0.042 (0.087)	-0.042 (0.088)	-0.058 (0.086)	-0.058 (0.087)	-0.060 (0.087)
Age	-0.009 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.011 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)	-0.010 (0.007)
Risk Attitude	0.001 (0.011)	0.000 (0.011)	0.000 (0.011)	0.001 (0.011)	0.001 (0.011)	0.000 (0.011)	0.001 (0.011)	0.001 (0.011)	0.000 (0.012)	-0.000 (0.011)	-0.000 (0.012)	0.001 (0.011)	0.001 (0.011)	0.001 (0.012)
GQD	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
DG	-0.004** (0.002)	-0.004* (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.004** (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)	-0.004* (0.002)
Constant	0.555 (0.422)	1.027*** (0.202)	0.453 (0.440)	1.011 (0.615)	0.414 (0.443)	0.336 (0.457)	1.148** (0.462)	1.144** (0.479)	1.372* (0.728)	1.277*** (0.486)	1.277** (0.507)	1.106*** (0.251)	1.106*** (0.253)	1.250*** (0.366)
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134
R-squared	0.067	0.056	0.072	0.084	0.074	0.078	0.056	0.056	0.058	0.073	0.073	0.058	0.058	0.060

Dummy female=1 and male=0; IRI/BES/xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Table A.7: Guessing Game -Quadratic Distance (OLS Estimate)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	QD	QD	QD	QD	QD	QD	QD	QD	QD	QD	QD	QD	QD	QD
Avg-Empathy-BES	471.070**		416.906*	415.276										
	(203.736)		(232.748)	(336.320)										
Female		287.585	104.050	91.917		98.542		143.643	2,133.301		170.136		206.803	790.018
		(189.533)	(214.038)	(1,813.424)		(216.223)		(207.990)	(2,053.492)		(211.364)		(200.530)	(849.561)
Bes X Female				0.162										
				(23.998)										
Cognitive Empathy BES					16.837	15.518								
					(26.087)	(26.328)								
Affective Empathy BES					27.460	24.171								
					(17.304)	(18.800)								
BES Cognitive x Female							574.472**	486.905	814.931*					
							(269.872)	(298.674)	(450.202)					
Avg-Empathy-IRI									-21.242					
									(21.811)					
IRI x Female										39.736*	37.663			
										(22.630)	(22.808)			
Fantasy (IRI)										-10.000	-15.730			
										(29.556)	(30.442)			
Perspective Taking (IRI)										15.627	12.522			
										(27.706)	(28.012)			
Empathic Concern (IRI)										21.288	15.231			
										(22.877)	(24.113)			
Personal Distress (IRI)												636.402	496.588	934.601
												(385.768)	(408.807)	(743.045)
Avg-Empathy-EQ														-15.878
														(22.473)
Experience	-8.250	-26.247	-10.248	-10.338	-5.192	-7.652	-16.541	-17.920	16.039	18.595	18.784	-28.472	-27.839	-21.247
	(183.805)	(185.768)	(184.402)	(185.609)	(184.794)	(185.452)	(184.259)	(184.647)	(187.947)	(186.906)	(187.170)	(185.473)	(185.428)	(186.029)
Age	5.772	5.116	6.488	6.473	6.013	6.646	3.209	4.612	5.532	4.881	6.794	1.887	4.197	4.153
	(14.411)	(14.633)	(14.529)	(14.763)	(14.488)	(14.600)	(14.370)	(14.543)	(14.576)	(14.581)	(14.794)	(14.457)	(14.626)	(14.655)
Risk Attitude	5.046	7.540	6.268	6.278	5.061	6.215	2.972	4.983	6.730	1.992	4.588	2.952	5.851	5.721
	(24.186)	(24.587)	(24.388)	(24.535)	(24.274)	(24.481)	(24.257)	(24.480)	(24.551)	(24.466)	(24.712)	(24.426)	(24.581)	(24.631)
DG	-5.419	-5.142	-5.652	-5.657	-5.515	-5.718	-6.446	-6.620	-5.903	-7.096	-7.330*	-4.695	-5.329	-4.790
	(4.245)	(4.312)	(4.285)	(4.363)	(4.274)	(4.311)	(4.363)	(4.379)	(4.441)	(4.407)	(4.422)	(4.264)	(4.307)	(4.382)
Constant	-1,079.888	546.040	-950.109	-943.840	-996.699	-889.224	-1,131.050	-955.800	-2,076.358	-778.798	-538.868	186.564	149.859	-248.536
	(897.454)	(432.477)	(938.898)	(1,324.436)	(948.492)	(980.254)	(982.340)	(1,016.536)	(1,535.432)	(1,034.977)	(1,078.448)	(539.995)	(541.033)	(782.194)
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134
R-squared	0.047	0.025	0.049	0.049	0.048	0.049	0.041	0.045	0.052	0.056	0.061	0.028	0.036	0.040

Dummy female=1 and male=0; IRI/BES/xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Table A.8: Guessing Game-Number Guess (OLS Estimate)

VARIABLES	(1) GG-N°	(2) GG-N°	(3) GG-N°	(4) GG-N°	(5) GG-N°	(6) GG-N°	(7) GG-N°	(8) GG-N°	(9) GG-N°	(10) GG-N°	(11) GG-N°	(12) GG-N°	(13) GG-N°	(14) GG-N°
Avg-Empathy-BES	13.706*** (4.346)		10.377** (4.931)	12.390* (7.121)										
Female		10.963*** (4.034)	6.395 (4.534)	21.375 (38.394)		7.285 (4.527)		8.553* (4.445)	3.031 (44.043)		9.559** (4.515)		8.079* (4.223)	28.864 (17.825)
Bes X Female				-0.200 (0.508)										
Cognitive Empathy BES					1.478*** (0.551)	1.380** (0.551)								
Affective Empathy BES					0.224 (0.366)	-0.019 (0.394)								
BES Cognitive x Female							13.367** (5.839)	8.154 (6.382)	7.243 (9.656)					
Avg-Empathy-IRI									0.059 (0.468)					
IRI x Female										0.632 (0.491)	0.515 (0.487)			
Fantasy (IRI)										0.294 (0.641)	-0.028 (0.650)			
Perspective Taking (IRI)										0.706 (0.601)	0.531 (0.598)			
Empathic Concern (IRI)										-0.065 (0.496)	-0.405 (0.515)			
Personal Distress (IRI)												23.190*** (8.206)	17.728** (8.609)	33.337** (15.590)
Avg-Empathy-EQ														-0.566 (0.472)
Experience	-1.229 (3.921)	-1.750 (3.954)	-1.351 (3.907)	-1.241 (3.930)	-1.589 (3.906)	-1.771 (3.883)	-1.528 (3.987)	-1.610 (3.946)	-1.704 (4.031)	-1.448 (4.053)	-1.437 (3.998)	-1.831 (3.945)	-1.807 (3.905)	-1.572 (3.903)
Age	0.278 (0.307)	0.288 (0.311)	0.322 (0.308)	0.341 (0.313)	0.250 (0.306)	0.297 (0.306)	0.196 (0.311)	0.280 (0.311)	0.277 (0.313)	0.235 (0.316)	0.343 (0.316)	0.165 (0.308)	0.256 (0.308)	0.254 (0.307)
Risk Attitude	-0.245 (0.516)	-0.138 (0.523)	-0.170 (0.517)	-0.183 (0.519)	-0.247 (0.513)	-0.161 (0.513)	-0.301 (0.525)	-0.181 (0.523)	-0.186 (0.527)	-0.243 (0.531)	-0.097 (0.528)	-0.312 (0.520)	-0.198 (0.518)	-0.203 (0.517)
DG	-0.122 (0.091)	-0.123 (0.092)	-0.136 (0.091)	-0.130 (0.092)	-0.110 (0.090)	-0.125 (0.090)	-0.138 (0.094)	-0.148 (0.094)	-0.150 (0.095)	-0.138 (0.096)	-0.151 (0.094)	-0.105 (0.091)	-0.130 (0.091)	-0.111 (0.092)
Constant	-11.125 (19.143)	34.092*** (9.205)	-3.149 (19.891)	-10.889 (28.041)	-20.938 (20.046)	-12.992 (20.525)	-1.492 (21.255)	8.943 (21.722)	12.053 (32.932)	2.547 (22.444)	16.027 (23.035)	21.383* (11.486)	19.949* (11.394)	5.751 (16.411)
Observations	134	134	134	134	134	134	134	134	134	134	134	134	134	134
R-squared	0.082	0.065	0.097	0.098	0.100	0.118	0.050	0.077	0.077	0.061	0.094	0.069	0.095	0.105

Dummy female=1 and male=0; IRI/BES/xFemale=Interaction Empathy Test*Female; P-value: *** p < 0.01, ** p < 0.05, * p < 0.1. Standard Error in Parenthesis

Appendix Chapter 2: Experimental Instructions

General Instructions

Welcome and thank you for deciding to participate to this experiment. The purpose of this session is to study how people make decisions in particular situations. Feel free to ask questions as they arise, we will answer you privately. From now until the end of the session, unauthorized communication of any nature with other participants is prohibited. Decisions are to be made individually, in private. This is not a test, so there are no right or wrong answers. Just think about what is best for you and act accordingly. Your decisions will be strictly anonymous and could not be linked to you in any way. The data collected will be used only for scientific purposes and stored for the duration of this study. Immediately upon completion of the session you will be paid € 2.5 as show-up fee and one of your decisions will be randomly selected to determine corresponding earning. Note that you will be paired with a different person in each situation who will also get a reward that will depend on your own choice or both of you choices, depending on the situation. You will not be told who you are matched with during or after the experiment, and he or she will not be told who you are either during or after the experiment. The experiment involves three phases, and overall, it will last approximately 90 minutes.

GENERAL INSTRUCTIONS - Phase 1

Now starting a phase of the experiment. In this part of the experiment you will be paired in each situation with a different person who will also get a reward that will depend on your own choice or both of you choices, depending on the situation. You will not be told who you are matched with during or after the experiment, and he or she will not be told who you are either during or after the experiment.

1- DICTATOR'S GAME

In this task there are two subjects: Person A and Person B. Person A has to decide what portion, if any, of 100 experimental points he/she wants to transfer to Person B who is paired with. Person B does not have a decision to make, what happens only depends on the Person A. Person B will just have to wait for Person A's decision. If Person A transfers 0 points to Person B, Person A keeps 100 experimental points and Person B will get 0 points; if Person A transfers 10 points to Person B, Person A will get 90 points and Person B 10, and so on. You will make decisions as Person A and you will also play the role of Person B. If this decision will be drawn to be paid at the end of this session, we will pay you for one of two roles: either as Person A or as Person B with a probability of 0.5.

Now you are Person A. Your decision is a simple one: decide what portion, if any, of 100 experimental points, you want to transfer to Person B you are paired with.

Your choice can be anywhere from 0 to 100, in 10 points increments. Remember what happens only depends on you.

Your choices will give you the chance to get a certain number of experimental points that will be converted in money (6 experimental points = €1).

Now it is time to make your decision.

How much do you want transfer to Person B?

2- PRISONER'S DILEMMA

There are two players in the game: you and another player you are paired with. Each of you has two actions: Action C and Action D. In order to play the game, both of you simultaneously choose one of your actions. Remember your earnings depend both on your action choice and the other player's action choice. Your choices will give you the chance to get a certain number of experimental points that will be converted in money (6 experimental points = €1).

If you and the other player play C, both of you will get 60 experimental points;

if you play C and the other player plays D, you will get 30 points and the other player will get 90 points;

if you and the other player play D, both of you will get 40 points;

if you play D and the other player plays C, you will get 90 experimental points and the other player will get 30 points.

The table below summarizes the game. Your actions and payoffs are written in before the comma 'YOU , Other'

		Player B	
		Cooperate	Defect
Player A	Cooperate	60,60	30,90
	Defect	90,30	40,40

Now verify if you have understood the game.

#1 If the other player plays D and you play C:

- You get...
- Other player gets...

#2 If the other player plays C and you play D:

- You get...
- Other player gets...

Which action would you like to play, Action C or Action D?

3- ULTIMATUM GAME

There are two players in the game: Person A and Person B. Person A has 100 experimental points as initial endowment and he/she must decide how much of that amount he/she wants to send to Person B. In turn, person B may accept or reject Person A's offer. If Person B accepts, he/she gets the money that Person A sent, and Person A keeps 100 experimental points minus the amount sent; if Person B rejects Person A's offer, no one gets anything (0 points). For instance, if Person A sends 10 points to Person B and Person B rejects that offer, no one will get anything; if Person B, instead, accepts Person A's offer, he/she will get 10 points and Person A will get 90 points (100 initial points minus 10 points sent to Person B).

You will make decisions both as Person A and as Person B. Your choices will give you the chance to get a certain number of experimental points that will be converted in money (6 experimental points = €1). If this decision will be drawn to be paid at the end of this session, we will pay you for one of two roles: either as Person A or as Person B with a probability of 0.5.

Control questions

Now verify if you have understood the game.

You are Person A and assume that your initial endowment is 10 points.

#1: You send to Person B 3 points. Person B accepts your offer. How much do you get?

- You get...

- Person B gets...

#2: You send to Person B 4 points. Person B rejects your offer. How much do you get?

- You get...

- Person B gets...

You are Person B and assume that initial endowment of Person A is 10 points.

#3: Person A sends you 2 points. You reject that offer. How much do you get?

- You get...

- Person A gets...

#4: Person A sends you 4 points. You accept the offer. How much do you get?

- You get...

- Person A gets...

You are Person A. Your initial endowment is 100 experimental points.

How much of your initial endowment do you want to send to Person B (in 10 points increments)?

You are Person B. Initial endowment of person A is 100 experimental points. Person A sends you:

0, do you accept or reject?

10, do you accept or reject?

20, do you accept or reject?

30, do you accept or reject?

40, do you accept or reject?

50, do you accept or reject?

60, do you accept or reject?

70, do you accept or reject?

80, do you accept or reject?

90, do you accept or reject?

100, do you accept or reject?

4- TRUST GAME

There are two players in the game: Person A and Person B.

Person A has 50 experimental points as initial endowment and he/she must decide how much of this amount, if any, he/she wants to send to person B. Person B will receive that amount multiplied by 3.

For instance, if Person A sends to Person B 10 points, Person B will receive 30 points; if Person A sends to Person B 20 points, Person B will receive 60 points, and so on.

In turn, Person B will have to decide how much of amount received, if any, he/she wants to re send to Person A.

You will make decisions both as Person A and as Person B. If this decision will be drawn to be paid at the end of this session, we will pay you for one of two roles: either as Person A or as Person B with a probability of 0.5.

Person A's earnings will be equal to: initial endowment minus (-) points sent to Person B plus (+) points received by Person B.

Person B's earnings will be equal to: points received by Person A multiplied by 3 minus (-) points re-sent to person A.

Your choices will give you the chance to get a certain number of experimental points that will be converted in money (6 experimental points = €1).

Control questions

Now verify if you have understood the game.

You are Person A and suppose that your initial endowment is 10 points.

#1 If you send 3 points to Person B, how much does person B get?

#2 If you send 4 points to Person B and Person B re sends you 0, how much do you get?

- You get...

- Person B gets...

Now you are Person B and suppose that initial endowment of person A is 10 points.

#3 Person A sends you 2 points, how much do you receive?

- You get...

#4 Person A sends you 5 points and you re-send 0 points, how much do you get?

- You get...

- Person A gets...

You are Person A and your initial endowment is 50 experimental points.

How much of your initial endowment of 50 experimental points do you want to send to Person B (in 10 points increments)?

You are Person B and the initial endowment of Person A is 50 experimental points. If Person A sends you:

10 (so you receive 30). How many points do you send back in increments of 10 experimental points?

20 (so you receive 60). How many points do you send back in increments of 10 experimental points?

30 (so you receive 90). How many points do you send back in increments of 10 experimental points?

40 (so you receive 120). How many points do you send back in increments of 10 experimental points?

50 (so you receive 150). How many points do you send back in increments of 10 experimental points?

5- GUESSING GAME

You are a member of a group of twenty eight people. All group members have the same instruction like you. Each person of your group has to choose a number between 0 and 100. The chosen numbers of your group members will remain unknown to you.

Example:

X1= your chosen number

X2= the number chosen by the 2nd person

X3= the number chosen by the 3rd person

...

Xn= the number chosen by the Nth person

The average is determinate by $= \frac{X1+X2+X3+\dots+Xn}{N}$

The winner is the person whose number is closest to $\frac{2}{3}$ of the average of all chosen numbers.

For instance, if the average is 65, the winner is the person who guesses the number $\frac{2}{3} * 65 = 43$

The winner will obtain 300 experimental points. If it exists more than one winner the reward will be shared equally.

Each person of your group has to choose a number between 0 and 100 where 0 and 100 are possible as well.

Please give your number:

6- HOLT-LAURY TEST

During this task you will be asked to make 15 different decisions; for each decision you will have to choose between OPTION A and OPTION B. You may choose A for some decision and B for other. Your earnings will be determined as follows:

Step	Option A	Option B
1	30	0 with probability =0.5; 120 with probability =0.5
2	33	0 with probability =0.5; 120 with probability =0.5
3	36	0 with probability =0.5; 120 with probability =0.5
4	39	0 with probability =0.5; 120 with probability =0.5
5	42	0 with probability =0.5; 120 with probability =0.5
6	45	0 with probability =0.5; 120 with probability =0.5
7	48	0 with probability =0.5; 120 with probability =0.5
8	51	0 with probability =0.5; 120 with probability =0.5
9	54	0 with probability =0.5; 120 with probability =0.5
10	57	0 with probability =0.5; 120 with probability =0.5
11	60	0 with probability =0.5; 120 with probability =0.5
12	63	0 with probability =0.5; 120 with probability =0.5
13	66	0 with probability =0.5; 120 with probability =0.5
14	69	0 with probability =0.5; 120 with probability =0.5
15	72	0 with probability =0.5; 120 with probability =0.5

Firstly, we will extract a number between 1 and 15, which will determine which decision will be paid.

Then, we will look what your payoff is, according to the option you chose, A or B. You will not know in advance which decision will be used and obviously, each decision has an equal chance of being selected in the end. Your choices will give you the chance to get a certain number of experimental points that will be converted in money (6 points = €1).

Empathy Tests' instructions

Interpersonal Reactivity Index (IRI)

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter on the answer sheet next to the item number.

READ EACH ITEM CAREFULLY BEFORE RESPONDING.

Answer as honestly as you can. Thank you.

ANSWER SCALE:

A	B	C	D	E
Does not describe me well				Describes me very well

N	Item	A	B	C	D	E
1	I daydream and fantasize, with some regularity, about things that might happen to me. (FS)					
2	I often have tender, concerned feelings for people less fortunate than me. (EC)					
3	I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-)					
4	Sometimes I don't feel very sorry for other people when they are having problems. (EC) (-)					
5	I really get involved with the feelings of the characters in a novel. (FS)					
6	In emergency situations, I feel apprehensive and ill-at-ease. (PD)					
7	I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-)					
8	I try to look at everybody's side of a disagreement before I make a decision. (PT)					
9	When I see someone being taken advantage of, I feel kind of protective towards them. (EC)					
10	I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)					
11	I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)					

12	Becoming extremely involved in a good book or movie is somewhat rare for me. (FS) (-)				
13	When I see someone get hurt, I tend to remain calm. (PD) (-)				
14	Other people's misfortunes do not usually disturb me a great deal. (EC) (-)				
15	If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-)				
16	After seeing a play or movie, I have felt as though I were one of the characters. (FS)				
17	Being in a tense emotional situation scares me. (PD)				
18	When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-)				
19	I am usually pretty effective in dealing with emergencies. (PD) (-)				
20	I am often quite touched by things that I see happen. (EC)				
21	I believe that there are two sides to every question and try to look at them both. (PT)				
22	I would describe myself as a pretty soft-hearted person. (EC)				
23	When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)				
24	I tend to lose control during emergencies. (PD)				
25	When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)				
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. (FS)				
27	When I see someone who badly needs help in an emergency, I go to pieces. (PD)				
28	Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)				

NOTE:(-) denotes items to be scored in reverse way;

PT=perspective-taking scale; FS=fantasy scale; EC=empathic concern scale; PD=personal distress scale;

Scores: A=0; B=1; C=2; D=3; E=4,except for reversed-scored items, which are scored:A=4; B=3; C=2; D=1; E=0;Adapted from Davis (1983).

Empathy Quotient (EQ)

ALL INFORMATION REMAINS STRICTLY CONFIDENTIAL

HOW TO FILL OUT THE QUESTIONNAIRE

Below are a list of statements. Please read each statement very carefully and rate how strongly you agree or disagree with it by circling your answer. There are no right or wrong answers, or trick questions.

IN ORDER FOR THE SCALE TO BE VALID, YOU MUST ANSWER EVERY QUESTION.

Examples:

N	Item	Answers			
E1.	I would be very upset if I couldn't listen to music every day.	strongly agree	slightly agree	slightly disagree	strongly disagree
E2.	I prefer to speak to my friends on the phone rather than write letters to them.	strongly agree	slightly agree	slightly disagree	strongly disagree
E3.	I have no desire to travel to different parts of the world.	strongly agree	slightly agree	slightly disagree	Strongly disagree
E4.	I prefer to read than to dance.	strongly agree	slightly agree	slightly disagree	Strongly disagree

N	Item	Answers			
1	I can easily tell if someone else wants to enter a conversation.	strongly agree	slightly agree	slightly disagree	strongly disagree
2	I find it difficult to explain to others things that I understand easily, when they don't understand it first time. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
3	I really enjoy caring for other people.	strongly agree	slightly agree	slightly disagree	strongly disagree
4	I find it hard to know what to do in a social situation. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
5	People often tell me that I went too far in driving my point home in a discussion. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
6	It doesn't bother me too much if I am late meeting a friend. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
7	Friendships and relationships are just too difficult, so I tend not to bother with them. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree

8	I often find it difficult to judge if something is rude or polite. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
9	In a conversation, I tend to focus on my own thoughts rather than on what my listener might be thinking. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
10	When I was a child, I enjoyed cutting up worms to see what would happen. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
11	I can pick up quickly if someone says one thing but means another.	strongly agree	slightly agree	slightly disagree	strongly disagree
12	It is hard for me to see why some things upset people so much. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
13	I find it easy to put myself in somebody else's shoes.	strongly agree	slightly agree	slightly disagree	strongly disagree
14	I am good at predicting how someone will feel.	strongly agree	slightly agree	slightly disagree	strongly disagree
15	I am quick to spot when someone in a group is feeling awkward or uncomfortable.	strongly agree	slightly agree	slightly disagree	strongly disagree
16	If I say something that someone else is offended by, I think that that's their problem, not mine. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
17	If anyone asked me if I liked their haircut, I would reply truthfully, even if I didn't like it. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
18	I can't always see why someone should have felt offended by a remark. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
19	Seeing people cry doesn't really upset me. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
20	I am very blunt, which some people take to be rudeness, even though this is unintentional. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
21	I don't tend to find social situations confusing.	strongly agree	slightly agree	slightly disagree	strongly disagree
22	Other people tell me I am good at understanding how they are feeling and what they are thinking.	strongly agree	slightly agree	slightly disagree	strongly disagree
23	When I talk to people, I tend to talk about their experiences rather than my own.	strongly agree	slightly agree	slightly disagree	strongly disagree
24	It upsets me to see an animal in pain.	strongly agree	slightly agree	slightly disagree	strongly disagree

	agree	agree	disagree	disagree
25 I am able to make decisions without being influenced by people's feelings. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
26 I can easily tell if someone else is interested or bored with what I am saying.	strongly agree	slightly agree	slightly disagree	strongly disagree
27 I get upset if I see people suffering on news programmes.	strongly agree	slightly agree	slightly disagree	strongly disagree
28 Friends usually talk to me about their problems as they say that I am very understanding.	strongly agree	slightly agree	slightly disagree	strongly disagree
29 I can sense if I am intruding, even if the other person doesn't tell me.	strongly agree	slightly agree	slightly disagree	strongly disagree
30 People sometimes tell me that I have gone too far with teasing. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
31 Other people often say that I am insensitive, though I don't always see why. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
32 If I see a stranger in a group, I think that it is up to them to make an effort to join in. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
33 I usually stay emotionally detached when watching a film. (-)	strongly agree	slightly agree	slightly disagree	strongly disagree
34 I can tune into how someone else feels rapidly and intuitively.	strongly agree	slightly agree	slightly disagree	strongly disagree
35 I can easily work out what another person might want to talk about.	strongly agree	slightly agree	slightly disagree	strongly disagree
36 I can tell if someone is masking their true emotion.	strongly agree	slightly agree	slightly disagree	strongly disagree
37 I don't consciously work out the rules of social situations.	strongly agree	slightly agree	slightly disagree	strongly disagree
38 I am good at predicting what someone will do.	strongly agree	slightly agree	slightly disagree	strongly disagree
39 I tend to get emotionally involved with a friend's problems.	strongly agree	slightly agree	slightly disagree	strongly disagree
40 I can usually appreciate the other person's viewpoint, even if I don't agree with it.	strongly agree	slightly agree	slightly disagree	strongly disagree

NOTE: (-) denotes items to be scored in reverse way;

Scores: Strongly Agree=2; Slightly Agree=1; Slightly Disagree=0; Strongly Disagree=0, except for reversed-scored items, which are scored: Strongly Agree=0; Slightly Agree=0; Slightly Disagree=1; Strongly Disagree=0;

Adapted from Baron-Cohen and Wheelwright (2004)

Basic Empathy Scale (BES)

The following are characteristics that may or may not apply to you. Please tick one answer for each statement to indicate how much you agree or disagree with each statement. Please answer as honestly as you can.

ANSWER SCALE:

1	2	3	4	5							
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree							
N	Item						1	2	3	4	5
1	My friend's emotions don't affect me much.(AE) (-)										
2	After being with a friend who is sad about something, I usually feel sad. (AE)										
3	I can understand my friend's happiness when she/he does well at something. (CE)										
4	I get frightened when I watch characters in a good scary movie. (AE)										
5	I get caught up in other people's feelings easily. (AE)										
6	I find it hard to know when my friends are frightened. (CE) (-)										
7	I don't become sad when I see other people crying. (AE) (-)										
8	Other people's feelings don't bother me at all. (AE) (-)										
9	When someone is feeling 'down' I can usually understand how they feel. (CE)										
10	I can usually work out when my friends are scared. (CE)										
11	I often become sad when watching sad things on TV or in films. (AE)										
12	I can often understand how people are feeling even before they tell me. (CE)										
13	Seeing a person who has been angered has no effect on my feelings. (AE) (-)										
14	I can usually work out when people are cheerful. (CE)										
15	I tend to feel scared when I am with friends who are afraid. (AE)										

16	I can usually realise quickly when a friend is angry. (CE)					
17	I often get swept up in my friend's feelings. (AE)					
18	My friend's unhappiness doesn't make me feel anything. (AE) (-)					
19	I am not usually aware of my friend's feelings. (CE) (-)					
20	I have trouble figuring out when my friends are happy. (CE) (-)					

NOTE: (-) denotes items to be scored in reverse way;

AE=Affective Empathy scale; CE=Cognitive Empathy scale;

Scores: Strongly Disagree=0, Disagree=1, Neither Agree nor Disagree=2, Agree=3, Strongly Agree=4;

Reversed-scored items: Strongly Disagree=4, Disagree=3, Neither Agree nor Disagree=2, Agree=1, Strongly Agree=0.

Adapted from Albiero, Matricardi and Toso (2010) and Jolliffe and Farrington (2006).

Once the scoring of the eight negative items is reverse, the nine cognitive items are summed to produce the score on the cognitive empathy scale and the eleven items are summed to produce the affective empathy score. All items are summed for the total score.

Appendix Chapter 3

APPENDIX 1 – LEGALITY RATING

The Legality Rating is an instrument designed to increase the competitiveness of lawful companies by supporting their ethical and honest initiatives. It was approved by the Italian Parliament at the end of 2012.

Two conditions must be met by the enterprises that work in Italy in order to ask for the legality rating:

1. Achieving a turnover of at least two million of euros in the year before asking for the legality rating. This value must be ascribed either to the single enterprise, or to the group to which the single enterprise belongs to and whose balance-sheet was duly approved;
2. To be signed up in the registry of businesses for at least two years.

Companies willing to be rated can apply throughout an online form, and follow the guidelines published on the AGCM website.

The legality rating ranges from a minimum score of one star to a maximum score of three stars, and it is awarded by the Italian Competition Authority (ICA) on the base of information directly provided by the company and further verified through cross-checks with data owned by the public administration.

“One-Star”-Legality Rating

In order to be eligible for the minimum score (i.e. the “one-star”-legality rating) a firm must fulfil the following requirements:

1. The entrepreneur and other relevant individuals must not be the recipients of preventive and / or precautionary measures, nor must they be convicted for tax-related crimes. They must not be addressed by judicial sentences for mafia, nor must they be involved with mafia activities of any sort. The firm must not have been submitted to compulsory administration, nor must it have been convicted for administrative wrongdoings.
2. In the 2-years period before applying for the legality rating the firm must not have been convicted for serious crimes related to anti-trust, for breaching the code of consumption, for not respecting norms about safety and security of the working place, or for not complying with the obligations towards employees and collaborators as for remunerations, contributions, insurance responsibilities, and fiscal matters. Moreover, the firm must not have been under scrutiny for declaring less income than what verified, for having experienced revocations of public funds that were not duly paid back by the firm itself, or for not having paid taxes. Likewise, the enterprise must not have received any sanction by the Italian Anti-Corruption Authority implying the prohibition either to sign contracts with the public administration, or to participate to auctions for public procurement.
3. Eventually, the company must declare to use exclusively traceable payment methods in order to process financial transactions whose value is higher than one thousand euros.

“Two-stars” and “three-stars”-legality rating

More requirements are needed for firms to be rated with two or three stars of legality. If at least six of the following accomplishments are met, then a firm will obtain two stars:

1. Complying with the Legality Protocol signed by the Ministry of Internal Affairs and the Italian Industrial Federation, with its guidelines for implementation, and with the Protocol signed by the Ministry of Internal Affairs and the Association of Cooperatives together with local prefectures and trade associations;
2. Using traceable payment methods also to process financial transactions whose amounts are lower than the threshold stated by the law;
3. Adopting an organizational framework apt to the conformity control as stated by the law;
4. Adopting processes that grant the Corporate Social Responsibility;
5. Being registered to lists of entities that are not prone to mafia infiltrations;
6. Endorsing the ethical codes of self-regulation that are defined by trade associations;
7. Having in place organizational frameworks to prevent and contrast **corruption**.

Denunciations of crimes by the entrepreneur and her family and collaborators, if followed by legal penal consequences, shall be hold in high esteem.

Duration of the legality rating

The legality rating lasts two years since its release, and it can be renewed upon request.

If one of the minimum prerequisites fails to exist, the ICA will revoke the one-star rating.

If conditions upon which a two-stars or a three-stars rating were awarded stop to be present, the ICA can reduce the legality rating.

The ICA will keep its website up to date with the list of companies awarded with the legality rating, along with effective dates and subsequent suspensions and revocations.

ENGLISH WEB PAGES ABOUT THE LEGALITY RATING BY AGCM:

<http://www.agcm.it/en/newsroom/press-releases/2196-boom-of-requests-to-antitrust-authority-to-obtain-the-rating-of-legality.html>

http://www.group.intesasanpaolo.com/scriptIsir0/si09/contentData/view/Rating_Legalit%C3%A0_eng.pdf?id=CNT-04-000000011635A&ct=application/pdf

http://www.agcm.it/en/statistics/doc_download/477-annualreport2014presentation.html

POLICY DOCUMENTS MENTIONING THE LEGALITY RATING BY AGCM:

Page 2: http://ec.europa.eu/competition/ecn/brief/03_2012/it_powers.pdf

APPENDIX 2– SUMMARY STATISTICS AND COMPLETE ESTIMATION TABLES

Table A2.1 Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ChoiceA	3600	0.381	0.486	0	1
AvgGroupChoiceA	3600	0.381	0.169	0	0.9
Belief about A	3600	3.959	1.928	0	10
Base	1200	0.500	0.500	0	1
Frame	3600	0.167	0.373	0	1
Frame (conformity)	3600	0.167	0.373	0	1
Redistribution (base)	3600	0.167	0.373	0	1
Redistribution (frame)	3600	0.167	0.373	0	1
Redistribution (conformity)	3600	0.167	0.373	0	1
Gender (male)	3600	0.500	0.500	0	1
Age	3600	24.911	4.454	18	42
Living conditions					
<i>(live alone)</i>	3600	0.061	0.240	0	1
<i>(live with the family)</i>	3600	0.706	0.456	0	1
<i>(live with other-not-related people)</i>	3600	0.233	0.423	0	1
Education (father's side)					
<i>(primary school)</i>	3600	0.083	0.276	0	1
<i>(middle school)</i>	3600	0.356	0.479	0	1
<i>(high school)</i>	3600	0.428	0.495	0	1
<i>(university)</i>	3600	0.122	0.328	0	1
<i>(other)</i>	3600	0.011	0.105	0	1
Education (mother's side)					
<i>(primary school)</i>	3600	0.094	0.292	0	1
<i>(middle school)</i>	3600	0.383	0.486	0	1
<i>(high school)</i>	3600	0.372	0.483	0	1
<i>(university)</i>	3600	0.139	0.346	0	1
<i>(other)</i>	3600	0.011	0.105	0	1
Employment status (father's side)					
<i>(self-employed)</i>	3600	0.139	0.346	0	1
<i>(clerk)</i>	3600	0.133	0.340	0	1
<i>(manual)</i>	3600	0.128	0.334	0	1
<i>(executive)</i>	3600	0.056	0.229	0	1
<i>(retired)</i>	3600	0.300	0.458	0	1
<i>(housework)</i>	3600	0.000	0.000	0	1
<i>(student)</i>	3600	0.000	0.000	0	1
<i>(entrepreneur)</i>	3600	0.089	0.285	0	1
<i>(unemployed)</i>	3600	0.050	0.218	0	1
<i>(other)</i>	3600	0.106	0.307	0	1
Employment status (mother's side)					
<i>(self-employed)</i>	3600	0.067	0.249	0	1
<i>(clerk)</i>	3600	0.211	0.408	0	1
<i>(manual)</i>	3600	0.050	0.218	0	1
<i>(executive)</i>	3600	0.006	0.074	0	1
<i>(retired)</i>	3600	0.094	0.292	0	1
<i>(housework)</i>	3600	0.428	0.495	0	1
<i>(student)</i>	3600	0.006	0.074	0	1
<i>(entrepreneur)</i>	3600	0.033	0.180	0	1
<i>(unemployed)</i>	3600	0.028	0.164	0	1
<i>(other)</i>	3600	0.078	0.268	0	1
Income level					
<i>(up to 15.000)</i>	3600	0.350	0.477	0	1
<i>(15.001 - 25.000)</i>	3600	0.250	0.433	0	1
<i>(25.001 - 35.000)</i>	3600	0.200	0.400	0	1
<i>(35.001 - 50.000)</i>	3600	0.100	0.300	0	1
<i>(50.001 - 90.000)</i>	3600	0.083	0.276	0	1
<i>(higher than 90.000)</i>	3600	0.017	0.128	0	1

Table A2.2 Full regression findings for Table

	Responsible choice			
	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{i,t}	0.600** (0.290)	0.880*** (0.278)	0.609** (0.291)	0.487* (0.293)
RedistributionBase	0.619*** (0.152)	0.581*** (0.151)	0.616*** (0.151)	0.587*** (0.152)
LegFrameRedistribution	0.753** (0.345)	0.831** (0.336)	0.882*** (0.339)	0.818** (0.336)
LegConfFrameRedistribution	0.962*** (0.350)	0.943*** (0.339)	1.008*** (0.342)	0.979*** (0.339)
LegFrame	0.417 (0.346)	0.522 (0.336)	0.548 (0.339)	0.498 (0.336)
LegConfFrame	0.562 (0.349)	0.578* (0.339)	0.606* (0.342)	0.616* (0.338)
E (AvgGroupPGChoice _{i,t}) - AvgGroupPGChoice _{i,t}				0.086*** (0.025)
Male		-0.138 (0.275)	-0.140 (0.278)	-0.144 (0.274)
Age		0.037 (0.032)	0.038 (0.032)	0.035 (0.032)
Living condition (live with the family)		-0.730 (0.610)	-0.714 (0.615)	-0.740 (0.608)
Living condition (live with other people)		-1.171* (0.631)	-1.156* (0.636)	-1.180* (0.628)
Education (father's side; middle school)		-0.364 (0.513)	-0.366 (0.517)	-0.333 (0.510)
Education (father's side; high school)		-0.417 (0.549)	-0.413 (0.553)	-0.388 (0.546)
Education (father's side; university)		-1.104* (0.650)	-1.095* (0.654)	-1.030 (0.647)
Education (father's side; other)		-5.534** (2.243)	-5.565** (2.250)	-5.460** (2.231)
Education (mother's side; middle school)		0.080 (0.505)	0.065 (0.509)	0.074 (0.502)
Education (mother's side; high school)		-0.241 (0.558)	-0.255 (0.562)	-0.255 (0.555)
Education (mother's side; university)		-0.609 (0.678)	-0.617 (0.684)	-0.610 (0.675)
Education (mother's side; other)		4.824*** (1.859)	4.855*** (1.868)	4.802*** (1.852)
Employment status (father's side; clerk)		0.073 (0.494)	0.077 (0.498)	0.071 (0.492)
Employment status (father's side; manual)		0.688 (0.479)	0.701 (0.483)	0.691 (0.477)
Employment status (father's side; executive)		0.106 (0.683)	0.114 (0.688)	0.083 (0.679)
Employment status (father's side; retired)		-0.104 (0.469)	-0.098 (0.473)	-0.079 (0.467)
Employment status (father's side; entrepreneur)		-0.135 (0.609)	-0.112 (0.614)	-0.147 (0.607)
Employment status (father's side; unemployed)		-0.555 (0.725)	-0.545 (0.730)	-0.519 (0.721)
Employment status (father's side; other)		0.906* (0.544)	0.914* (0.548)	0.927* (0.542)
Employment status (mother's side; clerk)		0.244 (0.573)	0.234 (0.578)	0.229 (0.571)
Employment status (mother's side; manual)		-0.341 (0.777)	-0.356 (0.783)	-0.355 (0.773)
Employment status (mother's side; executive)		-1.728 (2.221)	-1.691 (2.238)	-1.721 (2.211)
Employment status (mother's side; retired)		0.461 (0.721)	0.448 (0.727)	0.431 (0.718)
Employment status (mother's side; housework)		-0.408 (0.552)	-0.422 (0.556)	-0.416 (0.549)
Employment status (mother's side; student)		0.107 (1.673)	0.090 (1.688)	0.154 (1.666)
Employment status (mother's side; entrepreneur)		-0.218 (0.887)	-0.235 (0.893)	-0.212 (0.883)
Employment status (mother's side; unemployed)		0.522 (0.915)	0.531 (0.922)	0.566 (0.911)
Employment status (mother's side; other)		-1.226* (0.741)	-1.240* (0.746)	-1.224* (0.737)
Income level (15,001 - 25,000)		0.010 (0.355)	0.006 (0.358)	0.019 (0.353)
Income level (25,001 - 35,000)		-0.017 (0.394)	-0.033 (0.397)	-0.008 (0.392)
Income level (35,001 - 50,000)		-0.257 (0.503)	-0.268 (0.506)	-0.237 (0.500)
Income level (50,001 - 90,000)		0.744 (0.543)	0.757 (0.547)	0.757 (0.541)
Income level (higher than 90,000)		1.401 (1.374)	1.363 (1.384)	1.394 (1.369)
Round	-0.026*** (0.008)		-0.026*** (0.008)	-0.020** (0.009)
Constant	-1.253*** (0.281)	-1.142 (1.342)	-0.797 (1.357)	-1.067 (1.343)
Socio-demographics		√	√	√
Wald χ^2	52.01 (0.00)	79.95 (0.00)	88.04 (0.00)	99.79 (0.00)
Observations	3,420	3,420	3,420	3,420
Number of id	180	180	180	180

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A2.3 Full regression findings for Table 4

	Responsible choice			
	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{t-1}	0.474 (0.341)	0.887*** (0.323)	0.481 (0.342)	0.376 (0.343)
RedistributionBase	0.623*** (0.151)	0.570*** (0.150)	0.622*** (0.151)	0.580*** (0.152)
LegFrameRedistribution	0.761** (0.303)	0.910*** (0.301)	0.987*** (0.305)	0.893*** (0.299)
LegFrame AvgGroupPGChoice _{t-1}	0.424 (0.303)	0.609** (0.301)	0.652** (0.305)	0.580* (0.298)
E (AvgGroupPGChoice _{t+1}) - AvgGroupPGChoice _{t-1}				0.111*** (0.029)
Male		-0.005 (0.281)	-0.006 (0.285)	0.001 (0.277)
Age		0.041 (0.035)	0.042 (0.036)	0.039 (0.035)
Living condition (live with the family)		-0.302 (0.592)	-0.285 (0.600)	-0.358 (0.584)
Living condition (live with other people)		-0.848 (0.610)	-0.821 (0.618)	-0.880 (0.602)
Education (father's side; middle school)		-0.183 (0.509)	-0.183 (0.515)	-0.129 (0.501)
Education (father's side; high school)		-0.358 (0.546)	-0.343 (0.553)	-0.305 (0.538)
Education (father's side; university)		-1.015 (0.654)	-1.017 (0.662)	-0.957 (0.644)
Education (father's side; other)		-1.010 (1.556)	-0.993 (1.574)	-0.912 (1.531)
Education (mother's side; middle school)		-0.119 (0.544)	-0.146 (0.550)	-0.116 (0.535)
Education (mother's side; high school)		-0.307 (0.587)	-0.330 (0.594)	-0.308 (0.578)
Education (mother's side; university)		-0.386 (0.750)	-0.421 (0.760)	-0.405 (0.739)
Education (mother's side; other)		-0.222 (0.501)	-0.218 (0.507)	-0.219 (0.493)
Employment status (father's side; clerk)		0.072 (0.487)	0.076 (0.493)	0.071 (0.480)
Employment status (father's side; manual)		-0.948 (0.835)	-0.958 (0.845)	-0.969 (0.821)
Employment status (father's side; executive)		-0.910* (0.478)	-0.917* (0.484)	-0.859* (0.471)
Employment status (father's side; retired)		-0.900 (0.588)	-0.876 (0.595)	-0.926 (0.579)
Employment status (father's side; entrepreneur)		-0.364 (0.765)	-0.354 (0.774)	-0.355 (0.752)
Employment status (father's side; unemployed)		0.751 (0.556)	0.754 (0.563)	0.776 (0.548)
Employment status (father's side; other)		-0.122 (0.609)	-0.153 (0.617)	-0.177 (0.599)
Employment status (mother's side; clerk)		-0.542 (0.755)	-0.573 (0.765)	-0.570 (0.744)
Employment status (mother's side; manual)		-1.837 (1.949)	-1.821 (1.973)	-1.958 (1.921)
Employment status (mother's side; executive)		-0.118 (0.806)	-0.146 (0.816)	-0.192 (0.794)
Employment status (mother's side; retired)		-0.314 (0.598)	-0.344 (0.606)	-0.350 (0.589)
Employment status (mother's side; housework)		0.000 (0.930)	-0.020 (0.941)	0.009 (0.917)
Employment status (mother's side; student)		1.328 (0.991)	1.346 (1.003)	1.389 (0.976)
Employment status (mother's side; entrepreneur)		-1.117 (0.726)	-1.155 (0.735)	-1.146 (0.715)
Employment status (mother's side; unemployed)		-0.031 (0.362)	-0.047 (0.367)	-0.040 (0.357)
Employment status (mother's side; other)		0.201 (0.375)	0.174 (0.380)	0.205 (0.369)
Income level (15.001 - 25.000)		-0.548 (0.530)	-0.573 (0.536)	-0.522 (0.522)
Income level (25.001 - 35.000)		1.215* (0.620)	1.233** (0.628)	1.219** (0.611)
Income level (35.001 - 50.000)		1.787 (1.238)	1.767 (1.253)	1.836 (1.221)
Round	-0.036*** (0.010)		-0.036*** (0.010)	-0.029*** (0.010)
Constant	-1.076*** (0.272)	-1.191 (1.373)	-0.703 (1.397)	-1.048 (1.363)
Socio-demographics		√	√	√
Wald χ^2	44.07 (0.00)	66.53 (0.00)	76.85 (0.00)	92.27 (0.00)
Observations	2,280	2,280	2,280	2,280
Number of id	120	120	120	120

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A2.4 Full regression findings for Table 5

	Responsible choice			
	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{t-1}	0.702* (0.416)	1.042*** (0.385)	0.700* (0.416)	0.598 (0.421)
RedistributionBase	0.611*** (0.154)	0.571*** (0.153)	0.610*** (0.154)	0.597*** (0.154)
LegConfFrameRedistribution	0.982*** (0.360)	0.984*** (0.353)	1.042*** (0.356)	1.023*** (0.355)
LegConfFrame	0.554 (0.360)	0.577 (0.354)	0.611* (0.356)	0.618* (0.355)
E (AvgGroupPGChoice _{t-1}) - AvgGroupPGChoice _{t-1}				0.049 (0.031)
Male		-0.360 (0.373)	-0.362 (0.375)	-0.369 (0.373)
Age		0.034 (0.041)	0.034 (0.042)	0.033 (0.041)
Living condition (live with the family)		-0.614 (0.953)	-0.581 (0.958)	-0.593 (0.953)
Living condition (live with other people)		-0.989 (0.969)	-0.957 (0.975)	-0.962 (0.970)
Education (father's side; middle school)		-0.303 (0.748)	-0.299 (0.752)	-0.284 (0.749)
Education (father's side; high school)		-0.458 (0.815)	-0.449 (0.820)	-0.432 (0.816)
Education (father's side; university)		-0.547 (0.985)	-0.523 (0.990)	-0.487 (0.986)
Education (father's side; other)		-5.443** (2.400)	-5.478** (2.410)	-5.430** (2.405)
Education (mother's side; middle school)		0.512 (0.693)	0.516 (0.696)	0.511 (0.693)
Education (mother's side; high school)		-0.329 (0.806)	-0.330 (0.810)	-0.347 (0.806)
Education (mother's side; university)		-0.680 (0.924)	-0.675 (0.929)	-0.683 (0.924)
Education (mother's side; other)		5.596*** (1.959)	5.632*** (1.968)	5.590*** (1.962)
Employment status (father's side; clerk)		0.428 (0.607)	0.435 (0.610)	0.411 (0.607)
Employment status (father's side; manual)		1.178* (0.608)	1.197* (0.612)	1.185* (0.609)
Employment status (father's side; executive)		0.144 (0.897)	0.158 (0.902)	0.131 (0.898)
Employment status (father's side; retired)		0.535 (0.614)	0.553 (0.617)	0.547 (0.614)
Employment status (father's side; entrepreneur)		1.240 (0.897)	1.279 (0.902)	1.226 (0.898)
Employment status (father's side; unemployed)		-0.803 (0.861)	-0.800 (0.865)	-0.793 (0.861)
Employment status (father's side; other)		0.461 (0.698)	0.481 (0.702)	0.484 (0.699)
Employment status (mother's side; clerk)		0.345 (0.677)	0.336 (0.681)	0.328 (0.678)
Employment status (mother's side; manual)		-0.824 (1.018)	-0.829 (1.024)	-0.843 (1.019)
Employment status (mother's side; executive)		0.216 (0.869)	0.214 (0.874)	0.202 (0.870)
Employment status (mother's side; retired)		-0.818 (0.646)	-0.825 (0.650)	-0.825 (0.647)
Employment status (mother's side; housework)		0.360 (1.717)	0.353 (1.727)	0.393 (1.719)
Employment status (mother's side; student)		0.360 (1.717)	0.353 (1.727)	0.393 (1.719)
Employment status (mother's side; entrepreneur)		-1.128 (1.163)	-1.156 (1.169)	-1.117 (1.164)
Employment status (mother's side; unemployed)		1.334 (1.073)	1.338 (1.078)	1.341 (1.073)
Employment status (mother's side; other)		-1.210 (0.941)	-1.205 (0.946)	-1.192 (0.942)
Income level (15.001 - 25.000)		-0.271 (0.441)	-0.279 (0.444)	-0.268 (0.442)
Income level (25.001 - 35.000)		0.085 (0.531)	0.065 (0.534)	0.080 (0.531)
Income level (35.001 - 50.000)		-0.012 (0.665)	-0.024 (0.669)	-0.015 (0.666)
Income level (50.001 - 90.000)		0.610 (0.681)	0.617 (0.685)	0.628 (0.682)
Round		-0.023** (0.011)	-0.023** (0.011)	-0.020* (0.011)
Constant		-1.325*** (0.319)	-1.448 (1.869)	-1.152 (1.884)
Socio-demographics		√	√	√
Wald χ^2	39.24 (0.00)	69.55 (0.00)	73.00 (0.00)	75.52 (0.00)
Observations	2,280	2,280	2,280	2,280
Number of id	120	120	120	120

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A.2.5 Full Regressions findings for table 3.3 (empathy)

	Responsible choice			
	(1)	(2)	(3)	(4)
AvgGroupPGChoice _{i,t}	0.614** (0.291)	0.605** (0.291)	0.630** (0.291)	0.507* (0.294)
RedistributionBase	0.617*** (0.152)	0.617*** (0.151)	0.613*** (0.151)	0.585*** (0.152)
LegFrameRedistribution	0.777** (0.342)	0.749** (0.338)	0.887*** (0.333)	0.823** (0.330)
LegConfFrameRedistribution	0.960*** (0.346)	0.910*** (0.343)	0.993*** (0.336)	0.964*** (0.333)
LegFrame	0.444 (0.343)	0.415 (0.338)	0.556* (0.333)	0.506 (0.330)
LegConfFrame	0.561 (0.346)	0.510 (0.342)	0.591* (0.335)	0.602* (0.332)
E (AvgGroupPGChoice _{i,t}) - AvgGroupPGChoice _{i,t}				0.086*** (0.025)
Empathy	0.015** (0.007)	0.022*** (0.008)	0.021*** (0.008)	0.020*** (0.007)
Male		-0.534* (0.278)	-0.421 (0.291)	-0.422 (0.288)
Age		0.049* (0.029)	0.048 (0.032)	0.045 (0.031)
Living condition (live with the family)			-0.640 (0.605)	-0.668 (0.597)
Living condition (live with other people)			-0.943 (0.629)	-0.970 (0.621)
Education (father's side; middle school)			-0.335 (0.507)	-0.303 (0.500)
Education (father's side; high school)			-0.433 (0.542)	-0.408 (0.535)
Education (father's side; university)			-1.071* (0.641)	-1.007 (0.634)
Education (father's side; other)			-4.659** (2.124)	-4.564** (2.107)
Education (mother's side; middle school)			0.171 (0.500)	0.178 (0.494)
Education (mother's side; high school)			-0.090 (0.554)	-0.092 (0.547)
Education (mother's side; university)			-0.489 (0.671)	-0.483 (0.663)
Education (mother's side; other)			4.513** (1.805)	4.464** (1.789)
Employment status (father's side; clerk)			0.197 (0.490)	0.190 (0.485)
Employment status (father's side; manual)			0.831* (0.476)	0.820* (0.470)
Employment status (father's side; executive)			0.360 (0.681)	0.326 (0.673)
Employment status (father's side; retired)			-0.038 (0.464)	-0.019 (0.458)
Employment status (father's side; entrepreneur)			0.035 (0.605)	-0.002 (0.598)
Employment status (father's side; unemployed)			-0.169 (0.728)	-0.148 (0.720)
Employment status (father's side; other)			0.914* (0.538)	0.927* (0.532)
Employment status (mother's side; clerk)			0.303 (0.567)	0.296 (0.560)
Employment status (mother's side; manual)			0.016 (0.779)	0.011 (0.770)
Employment status (mother's side; executive)			-1.644 (2.194)	-1.675 (2.169)
Employment status (mother's side; retired)			0.719 (0.720)	0.699 (0.711)
Employment status (mother's side; housework)			-0.239 (0.549)	-0.236 (0.543)
Employment status (mother's side; student)			-0.392 (1.662)	-0.322 (1.640)
Employment status (mother's side; entrepreneur)			-0.126 (0.877)	-0.105 (0.866)
Employment status (mother's side; unemployed)			0.835 (0.910)	0.866 (0.899)
Employment status (mother's side; other)			-1.102 (0.735)	-1.089 (0.726)
Income level (15.001 - 25.000)			0.081 (0.352)	0.093 (0.348)
Income level (25.001 - 35.000)			0.010 (0.389)	0.035 (0.384)
Income level (35.001 - 50.000)			-0.102 (0.500)	-0.073 (0.494)
Income level (50.001 - 90.000)			0.974* (0.543)	0.970* (0.536)
Income level (higher than 90.000)			1.463 (1.358)	1.493 (1.344)
Round			-0.026*** (0.008)	-0.020** (0.009)
Constant	-2.707*** (0.758)	-4.318*** (1.116)	-3.471** (1.654)	-3.702** (1.636)
Socio-demographics			√	√
Wald χ^2	52.01 (0.00)	79.95 (0.00)	88.04 (0.00)	99.79 (0.00)
Observations	3,420	3,420	3,420	3,420
Number of id	180	180	180	180

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.

Appendix 3. Chapter 3 – Experimental Instructions

English Translation	Original Italian
<p>General instructions</p> <p>Welcome and thanks for participating to this experiment.</p> <p>Our goal is to verify the impact of some factors on our decision processes.</p> <p>Together with other participants you will have to take decisions in different situations. Depending of your decisions along with those of the other participants you will get a certain number of points. One among all your decision will be picked randomly and the points you get in that particular situation will be converted in euros (with the exchange rate 2 points = 1 euro) and paid to you in cash. Besides, you will receive 5 points for participating. These points will sum up to those gained during the experiment.</p> <p>Your identity and those of the other participants to the experiment will never be revealed even after the end of the experiment. Also your choices and answers will be dealt with anonymously (without reference to your identity).</p> <p>Overall the experimental session will last approximately one hour.</p> <p>We ask you to work alone and in silence.</p> <p>Thanks for your participation!</p>	<p>Istruzioni Generali</p> <p>Benvenuto e grazie per aver deciso di partecipare a questo studio.</p> <p>Siamo interessati alla comprensione di alcuni fattori che influenzano i nostri processi decisionali.</p> <p>Durante questo studio ti troverai a dover prendere delle decisioni in differenti situazioni. Le tue decisioni insieme alle decisioni prese dagli altri partecipanti allo studio determineranno la vincita di un certo numero di punti. Tra tutte le decisioni che prenderai, una verrà estratta in maniera casuale, e i punti guadagnati in quella situazione verranno convertiti in euro e pagati realmente (tasso di conversione 2 punti = 1 euro). Per la sola partecipazione, poi, riceverai 5 punti che andranno a sommarsi a quelli guadagnati durante la sessione.</p> <p>La tua identità e l'identità degli altri partecipanti non verranno mai svelate, né ora né dopo la fine dello studio. Anche tutte le tue scelte e ogni tua risposta verrà trattata in maniera assolutamente anonima senza nessun riferimento alla tua identità. Nel complesso la sessione durerà approssimativamente un'ora.</p> <p>Ti chiediamo di lavorare da solo e in silenzio.</p> <p>Grazie ancora per la tua partecipazione!</p>
<p>Specific instructions</p> <p>Baseline Condition</p> <p>In this session you will be asked to choose (for 10 rounds) which, between two products (product A and product B), you intend to buy. For every round you will be given an endowment of 20 points that you will be able to spend to purchase one of the two products. At each round, after your choice and the choices of all other players, we will tell to you and them, without revealing their identity, how many players have chosen product A and product B. After this information you will play the following round.</p>	<p>Istruzioni specifiche</p> <p>Gioco Base</p> <p>In questa situazione dovrai scegliere ripetutamente (per 10 volte) quale tra due prodotti (prodotto A e prodotto B) acquistare. Ogni volta ti verrà assegnata una certa dotazione di punti che potrai spendere per l'acquisto di uno dei prodotti. Dopo che tu e tutti gli altri avranno scelto, ti verrà comunicato (in maniera anonima) quanti giocatori hanno scelto il prodotto A e quanti il prodotto B prima di giocare nuovamente</p>

Round n

You receive an endowment of 20 points. You must choose whether to buy:

Product A

Product B.

Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

Product B costs 5 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows: (table A3.1)

Each of the 10 players is in the same situation as you and faces the same payoff table.

Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table: (table A3.2)

Please choose:

Product A

Product B

Redistribution Condition

Same as in the Base treatment plus:

Notice that, at the end of each round 1 point will be subtracted from the payoff of all those participants who have chosen product B. All those points will form a common fund that will equally divided among the participants who have chosen product A.

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows: (table A3.3)

Periodo n

Ricevi una dotazione iniziale di 20 punti. Devi decidere se:

Acquistare il prodotto A.

Acquistare il prodotto B.

Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.

Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare il prodotto A.

Le conseguenze (in termini di guadagni) delle due possibili scelte (acquistare il prodotto A o il prodotto B) sono riassunte nella tabella 1 (tabella A3.1) Ognuno dei 10 partecipanti si trova nella tua stessa situazione e ha la stessa tabella che descrive i guadagni a seconda delle scelte effettuate dagli altri giocatori.

Il tuo guadagno per ognuna delle 10 scelte dipende non solo da quale bene decidi di acquistare tu, ma anche dalle scelte di acquisto che faranno gli altri giocatori, secondo lo schema della tabella 2: (tabella A3.2)

Quale prodotto scegli?

Prodotto A

Prodotto B

Redistribuzione

Come nel trattamento base più:

Nota Bene: Rispetto alla situazione precedente però, ora c'è una novità. Ad ogni giocatore che avrà scelto il prodotto B verrà prelevato 1 punto che andrà a formare un fondo complessivo che verrà, poi, redistribuito in parti uguali a tutti i giocatori che avranno scelto il prodotto A.

Le conseguenze (in termini di guadagni) delle due possibili scelte (acquistare il prodotto A o il prodotto B) sono riassunte nella tabella n.3 (tabella A3.3).

<p>Each of the 10 players is in the same situation as you and faces the same payoff table.</p> <p>Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table: (table A3.4)</p> <p>Please choose:</p> <p>Product A</p> <p>Product B</p> <p>Frame Condition</p> <p><i>As in the Baseline plus framed description of Product A as follows</i></p> <p>Product A is a product or service provided by an enterprise awarded with the “3-stars legality rating”.</p> <p>This rating can be conferred by the Italian Competition Authority (i.e. Autorità Garante della Concorrenza e del Mercato, “Authority” from now on) upon request of a company. In order to be signaled with the 3-stars rating a company must have in place organizational frameworks to prevent and fight of corruption. Specifically, conditions for 3-stars rating are stated by the Authority as follows:</p> <ol style="list-style-type: none"> 1. the entrepreneur must not be involved in lawsuit for mafia, tax-evasion, antitrust behaviours, unfair practices towards employees and customers, and bad administration (minimum accomplishments to be 1-star rated); 2. the enterprise must accomplish ministerial codes of conduct, employ trackable paying methods, adopt organisational frameworks liable to the legal conformity control, endorse processes that guarantee the Corporate Social Responsibility, be listed among enterprises that are not tied to mafia, and adhere to existing ethical codes of conduct; 3. have in place organizational frameworks to prevent and fight corruption. <p>Product A costs 10 points. By buying product A you gain 3 points directly, and you will gain 3 points for each player who purchases product A</p>	<p>Ognuno dei 10 partecipanti si trova nella tua stessa situazione e ha la stessa tabella che descrive i guadagni a seconda delle scelte effettuate dagli altri giocatori.</p> <p>Il tuo guadagno per ognuna delle 10 scelte dipende non solo da quale bene decidi di acquistare tu, ma anche dalle scelte di acquisto che faranno gli altri giocatori, secondo lo schema della seguente tabella (tabella A3.4)</p> <p>Quale prodotto scegli?</p> <p>Prodotto A</p> <p>Prodotto B</p> <p>Frame</p> <p><i>Come nel gioco base più la descrizione del prodotto A come segue</i></p> <p>Il prodotto A è un bene venduto da un'impresa a cui è stato attribuito il certificato “3 stelle di legalità”. Questo certificato viene rilasciato dall’Autorità Garante della Concorrenza e del Mercato (AGCOM) su richiesta dell’impresa interessata. Per ottenere “3 stelle di legalità” è necessario che:</p> <ol style="list-style-type: none"> 1. L’imprenditore non sia coinvolto in processi per mafia, evasione fiscale, comportamenti anticoncorrenziali, comportamenti scorretti ai danni di lavoratori e consumatori, e cattiva amministrazione (requisiti minimi per l’ottenimento di “1 stella di legalità”); 2. L’impresa operi nel rispetto dei codici di condotta ministeriali, utilizzi sistemi di pagamento tracciabili, adotti modelli organizzativi che garantiscano i controlli di conformità, adotti processi in linea con la responsabilità sociale, compaia negli elenchi di imprese non legate all’organizzazione mafiosa, aderisca ai codici etici e di condotta esistenti 3. abbia “adottato modelli organizzativi di prevenzione e di contrasto della corruzione”. <p>Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.</p> <p>Il prodotto B è un bene o fornito da un'impresa priva del certificato di legalità AGCOM (può non averlo richiesto oppure non rispetta tutti i</p>
---	---

<p>too.</p> <p>Product B is a product or service provided by an enterprise which is not awarded with the legality rating issued by the Authority (i.e. either the company did not enquire for the rating, or it asked for the rating but did not obtain it).</p> <p>Product B costs 5 points. By buying product B you do not gain any point directly, but you will still gain 3 points for each player who purchases product A.</p>	<p>requisiti di cui sopra).</p> <p>Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare il prodotto A</p>
---	--

<p>English Translation</p> <p>General instructions</p> <p>Welcome and thanks for participating to this experiment.</p> <p>Our goal is to verify the impact of some factors on our decision processes.</p> <p>Together with other participants you will have to take decisions in different situations. Depending of your decisions along with those of the other participants you will get a certain number of points. One among all your decision will be picked randomly and the points you get in that particular situation will be converted in euros (with the exchange rate 2 points = 1 euro) and paid to you in cash. Besides, you will receive 5 points for participating. These points will sum up to those gained during the experiment.</p> <p>Your identity and those of the other participants to the experiment will never be revealed even after the end of the experiment. Also your choices and answers will be dealt with anonymously (without reference to your identity).</p> <p>Overall the experimental session will last approximately one hour.</p> <p>We ask you to work alone and in silence.</p> <p>Thanks for your participation!</p> <p>Specific instructions</p> <p>Baseline Condition</p> <p>In this session you will be asked to choose (for</p>	<p>Original Italian</p> <p>Istruzioni Generali</p> <p>Benvenuto e grazie per aver deciso di partecipare a questo studio.</p> <p>Siamo interessati alla comprensione di alcuni fattori che influenzano i nostri processi decisionali.</p> <p>Durante questo studio ti troverai a dover prendere delle decisioni in differenti situazioni. Le tue decisioni insieme alle decisioni prese dagli altri partecipanti allo studio determineranno la vincita di un certo numero di punti. Tra tutte le decisioni che prenderai, una verrà estratta in maniera casuale, e i punti guadagnati in quella situazione verranno convertiti in euro e pagati realmente (tasso di conversione 2 punti = 1 euro). Per la sola partecipazione, poi, riceverai 5 punti che andranno a sommarsi a quelli guadagnati durante la sessione.</p> <p>La tua identità e l'identità degli altri partecipanti non verranno mai svelate, né ora né dopo la fine dello studio. Anche tutte le tue scelte e ogni tua risposta verrà trattata in maniera assolutamente anonima senza nessun riferimento alla tua identità. Nel complesso la sessione durerà approssimativamente un'ora.</p> <p>Ti chiediamo di lavorare da solo e in silenzio.</p> <p>Grazie ancora per la tua partecipazione!</p> <p>Istruzioni specifiche</p> <p>Gioco Base</p> <p>In questa situazione dovrai scegliere</p>
---	---

10 rounds) which, between two products (product A and product B), you intend to buy. For every round you will be given an endowment of 20 points that you will be able to spend to purchase one of the two products. At each round, after your choice and the choices of all other players, we will tell to you and them, without revealing their identity, how many players have chosen product A and product B. After this information you will play the following round.

Round n

You receive an endowment of 20 points. You must choose whether to buy:

Product A

Product B.

Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

Product B costs 5 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows: (table A3.1)

Each of the 10 players is in the same situation as you and faces the same payoff table.

Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table: (table A3.2)

Please choose:

Product A

Product B

Redistribution Condition

Same as in the Base treatment plus:

Notice that, at the end of each round 1 point will be subtracted from the payoff of all those

ripetutamente (per 10 volte) quale tra due prodotti (prodotto A e prodotto B) acquistare. Ogni volta ti verrà assegnata una certa dotazione di punti che potrai spendere per l'acquisto di uno dei prodotti. Dopo che tu e tutti gli altri avranno scelto, ti verrà comunicato (in maniera anonima) quanti giocatori hanno scelto il prodotto A e quanti il prodotto B prima di giocare nuovamente

Periodo n

Ricevi una dotazione iniziale di 20 punti. Devi decidere se:

Acquistare il prodotto A.

Acquistare il prodotto B.

Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.

Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare il prodotto A.

Le conseguenze (in termini di guadagni) delle due possibili scelte (acquistare il prodotto A o il prodotto B) sono riassunte nella tabella 1 (tabella A3.1) Ognuno dei 10 partecipanti si trova nella tua stessa situazione e ha la stessa tabella che descrive i guadagni a seconda delle scelte effettuate dagli altri giocatori.

Il tuo guadagno per ognuna delle 10 scelte dipende non solo da quale bene decidi di acquistare tu, ma anche dalle scelte di acquisto che faranno gli altri giocatori, secondo lo schema della tabella 2: (tabella A3.2)

Quale prodotto scegli?

Prodotto A

Prodotto B

Redistribuzione

Come nel trattamento base più:

Nota Bene: Rispetto alla situazione precedente però, ora c'è una novità. Ad ogni giocatore che

participants who have chosen product B. All those points will form a common fund that will equally divided among the participants who have chosen product A.

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows: (table A3.3)

Each of the 10 players is in the same situation as you and faces the same payoff table.

Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table: (table A3.4)

Please choose:

Product A

Product B

Frame Condition

As in the Baseline plus framed description of Product A as follows

Product A is a product or service provided by an enterprise awarded with the "3-stars legality rating".

This rating can be conferred by the Italian Competition Authority (i.e. Autorità Garante della Concorrenza e del Mercato, "Authority" from now on) upon request of a company. In order to be signaled with the 3-stars rating a company must have in place organizational frameworks to prevent and fight of corruption. Specifically, conditions for 3-stars rating are stated by the Authority as follows:

1. the entrepreneur must not be involved in lawsuit for mafia, tax-evasion, antitrust behaviours, unfair practices towards employees and customers, and bad administration (minimum accomplishments to be 1-star rated);
2. the enterprise must accomplish ministerial codes of conduct, employ trackable paying methods, adopt organisational frameworks liable to the legal conformity control, endorse processes that guarantee the Corporate Social

avrà scelto il prodotto B verrà prelevato 1 punto che andrà a formare un fondo complessivo che verrà, poi, redistribuito in parti uguali a tutti i giocatori che avranno scelto il prodotto A.

Le conseguenze (in termini di guadagni) delle due possibili scelte (acquistare il prodotto A o il prodotto B) sono riassunte nella tabella n.3 (tabella A3.3).

Ognuno dei 10 partecipanti si trova nella tua stessa situazione e ha la stessa tabella che descrive i guadagni a seconda delle scelte effettuate dagli altri giocatori.

Il tuo guadagno per ognuna delle 10 scelte dipende non solo da quale bene decidi di acquistare tu, ma anche dalle scelte di acquisto che faranno gli altri giocatori, secondo lo schema della seguente tabella (tabella A3.4)

Quale prodotto scegli?

Prodotto A

Prodotto B

Frame

Come nel gioco base più la descrizione del prodotto A come segue

Il prodotto A è un bene venduto da un'impresa a cui è stato attribuito il certificato "3 stelle di legalità". Questo certificato viene rilasciato dall'Autorità Garante della Concorrenza e del Mercato (AGCOM) su richiesta dell'impresa interessata. Per ottenere "3 stelle di legalità" è necessario che:

1. L'imprenditore non sia coinvolto in processi per mafia, evasione fiscale, comportamenti anticoncorrenziali, comportamenti scorretti ai danni di lavoratori e consumatori, e cattiva amministrazione (requisiti minimi per l'ottenimento di "1 stella di legalità");
2. L'impresa operi nel rispetto dei codici di condotta ministeriali, utilizzi sistemi di pagamento tracciabili, adotti modelli organizzativi che garantiscano i controlli di conformità, adotti processi in linea con la responsabilità sociale, compaia negli elenchi di imprese non legate all'organizzazione mafiosa, aderisca ai codici etici e di condotta esistenti
3. abbia "adottato modelli organizzativi di

<p>Responsibility, be listed among enterprises that are not tied to mafia, and adhere to existing ethical codes of conduct;</p> <p>3. have in place organizational frameworks to prevent and fight corruption.</p> <p>Product A costs 10 points. By buying product A you gain 3 points directly, and you will gain 3 points for each player who purchases product A too.</p> <p>Product B is a product or service provided by an enterprise which is not awarded with the legality rating issued by the Authority (i.e. either the company did not enquire for the rating, or it asked for the rating but did not obtain it).</p> <p>Product B costs 5 points. By buying product B you do not gain any point directly, but you will still gain 3 points for each player who purchases product A.</p>	<p>prevenzione e di contrasto della corruzione”.</p> <p>Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.</p> <p>Il prodotto B è un bene o fornito da un’impresa priva del certificato di legalità AGCOM (può non averlo richiesto oppure non rispetta tutti i requisiti di cui sopra).</p> <p>Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare il prodotto A</p>
--	--

Table A3.1

	Payoff	
Your choice	Product A	Product B
Participation bonus	5 points	5 points
Endowment	20 points	20 points
Cost	-10 points	-5 points
Benefit (from the choice of other participants)	+3 points for each participant choosing product A	+3 points for each participant choosing product A

Table A3.2

	When you buy A				When you buy B			
<i>How many players choose good A</i>	<i>Endowment</i>	<i>Cost</i>	<i>Benefit</i>	<i>TOTAL</i>	<i>Endowment</i>	<i>Cost</i>	<i>Benefit</i>	<i>TOTAL</i>
			$3 \times n =$				$3 \times n =$	
10	20	-10	30	40	-	-	-	-
9	20	-10	27	37	20	-5	27	42
8	20	-10	24	34	20	-5	24	39
7	20	-10	21	31	20	-5	21	36
6	20	-10	18	28	20	-5	18	33
5	20	-10	15	25	20	-5	15	30
4	20	-10	12	22	20	-5	12	27
3	20	-10	9	19	20	-5	9	24
2	20	-10	6	16	20	-5	6	21
1	20	-10	3	13	20	-5	3	18
0	-	-	-	-	20	-5	0	15

Table A3.3

Your choice	Payoff	
	Product A	Product B
Participation bonus	5 points	5 points
Endowment	20 points	20 points
Cost	-10 points	-5 points
Benefit (from the choice of other participants)	+3 points for each participant choosing product A	+3 points for each participant choosing product A
Redistribution effect	The share of the total points withdrawn from the buyers of B equally distributed among the buyers of A	-1 point

Table A3.4

How many players choose good A	When you buy A					When you buy B				
	Endowment	Cost	Benefit	Redistribution	TOTAL	Endowment	Cost	Benefit	Redistribution	TOTAL
			$3 \times n$ =					$3 \times n$ =		
10	20	-10	30	-	40.0	-	-	-	-	-
9	20	-10	27	0.1	37.1	20	-5	27	-1	41.0
8	20	-10	24	0.3	34.3	20	-5	24	-1	38.0
7	20	-10	21	0.4	31.4	20	-5	21	-1	35.0
6	20	-10	18	0.7	28.7	20	-5	18	-1	32.0
5	20	-10	15	1.0	26.0	20	-5	15	-1	29.0
4	20	-10	12	1.5	23.5	20	-5	12	-1	26.0
3	20	-10	9	2.3	21.3	20	-5	9	-1	23.0
2	20	-10	6	4.0	20.0	20	-5	6	-1	20.0
1	20	-10	3	9.0	22.0	20	-5	3	-1	17.0
0	-	-	-	-	-	20	-5	0	-1	14.0

NOTE: While in sessions 7-15 at the end of each round is provided the number of co-players choosing product A among the members of the same group, in sessions 16-18 along with the information about the average share of co-operators observed in the parallel sessions 10-12. This kind of information is provided to disentangle conditional cooperation from conformist-type behavior.

Appendix Chapter 3 – Questionnaire

1. Empathy Test' Instructions

Interpersonal Reactivity Index (IRI)

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter on the answer sheet next to the item number. **READ EACH ITEM CAREFULLY BEFORE RESPONDING.** Answer as honestly as you can. Thank you.

ANSWER SCALE:

A	B	C	D	E
Does not describe me well				Describes me very well

N	Item	A	B	C	D	E
1	I daydream and fantasize, with some regularity, about things that might happen to me. (FS)					
2	I often have tender, concerned feelings for people less fortunate than me. (EC)					
3	I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-)					
4	Sometimes I don't feel very sorry for other people when they are having problems. (EC) (-)					
5	I really get involved with the feelings of the characters in a novel. (FS)					
6	In emergency situations, I feel apprehensive and ill-at-ease. (PD)					
7	I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-)					
8	I try to look at everybody's side of a disagreement before I make a decision. (PT)					
9	When I see someone being taken advantage of, I feel kind of protective towards them. (EC)					
10	I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)					
11	I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)					
12	Becoming extremely involved in a good book or movie is somewhat rare for me. (FS) (-)					

13	When I see someone get hurt, I tend to remain calm. (PD) (-)					
14	Other people's misfortunes do not usually disturb me a great deal. (EC) (-)					
15	If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-)					
16	After seeing a play or movie, I have felt as though I were one of the characters. (FS)					
17	Being in a tense emotional situation scares me. (PD)					
18	When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-)					
19	I am usually pretty effective in dealing with emergencies. (PD) (-)					
20	I am often quite touched by things that I see happen. (EC)					
21	I believe that there are two sides to every question and try to look at them both. (PT)					
22	I would describe myself as a pretty soft-hearted person. (EC)					
23	When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)					
24	I tend to lose control during emergencies. (PD)					
25	When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)					
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. (FS)					
27	When I see someone who badly needs help in an emergency, I go to pieces. (PD)					
28	Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)					

NOTE:(-) denotes items to be scored in reverse way;
PT=perspective-taking scale; FS=fantasy scale; EC=empathic concern scale; PD=personal distress scale;
Scores: A=0; B=1; C=2; D=3; E=4,except for reversed-scored items, which are scored:A=4; B=3; C=2; D=1;E=0;
Adapted from Davis (1983).

2. Questionnaire

1. Gender: ₁ M ₀ F
2. Age: _____ years
3. District of residence _____
4. Housing condition:
 - a. Live alone
 - b. Live with family
 - c. Live with other (not related) people
5. Father's education
₁ Primary School ₂ Middle School
₃ Upper Intermediate/High school ₄ University degree
₅ Other _____
6. Mother's education
₁ Primary School ₂ Middle School
₃ Upper Intermediate/High school ₄ University degree
₅ Other _____
7. Father's professional status
₁ Self-employed ₂ Clerk
₃ Manual worker ₄ Executive
₅ Retired ₆ Homemaker
₇ Student ₈ Entrepreneur
₉ Unemployed ₁₀ Other _____
8. Mother's professional status
₁ Self-employed ₂ Clerk
₃ Manual worker ₄ Executive
₅ Retired ₆ House activity
₇ Student ₈ Entrepreneur
₉ Unemployed ₁₀ Other _____
9. How many people are there in your household (including yourself)? _____

We would like to remind you that these data will only serve statistical purposes, that information will be handled anonymously and it shall never be disclosed at disaggregated level

10. Please, mark the class to which your annual household income (net) in 2015 belongs to

₁ up to 15.000 ₂ 15.001 - 25.000 ₃ 25.001 - 35.000

₄ 35.001 - 50.000 ₅ 50.001 - 90.000 ₆ higher than 90.000

On a scale from 0 to 10, please indicate your level of satisfaction with the experience of having undergone this experiment:

Not satisfied at all =0 Completely satisfied =10

0 1 2 3 4 5 6 7 8 9 10

11. On a scale from 0 to 10, please indicate your level of satisfaction about the behaviour of the players who participate in your same game:

Not satisfied at all = 0 Completely satisfied = 10

0 1 2 3 4 5 6 7 8 9 10

On a scale from 0 to 10, please indicate your level of satisfaction about your own behaviour in the game:

Not satisfied at all = 0 Completely satisfied = 10

0 1 2 3 4 5 6 7 8 9 10

12. On a scale from 0 to 10, how would you rate the overall trustworthiness of others?

None = 0 Complete = 10

0 1 2 3 4 5 6 7 8 9 10

13. On a scale from 0 to 10, how would you rate your overall satisfaction with life?

Not satisfied at all = 0 Completely satisfied = 10

0 1 2 3 4 5 6 7 8 9 10

14. On a scale from 0 to 10, how would you rate your satisfaction about your financial situation?

Not satisfied at all = 0 Completely satisfied = 10

0 1 2 3 4 5 6 7 8 9 10

15. Please tick the box that mostly represent your political orientation:

Extreme LEFT

Extreme RIGHT

16. Have you got an account on Facebook?

₁ YES

₀ NO

17. If you have an account on Facebook, how many friends do you have approximately on your account?

18. Have you got an account on Twitter?

₁ YES

₀ NO

19. If you have an account on Twitter, how many people do you follow?

20. If you have an account on Twitter, by how many people are followed by?

Appendix Chapter 4

Parametric specification of the VWG

Table 1: Costs and benefits in the Base Vote-with-the-wallet game (VWG) experiment

	Payoff	
Endowment	20	20
Your Choice	Product A	Product B
Cost	-10	-5
Benefit (from the choice of the other players)	+3 for each player choosing product A	+3 for each player choosing product A

Table 2: Players' payoff in the Base VWG experiment conditional to other players' choices.

How many players choose good A	When you buy good A				When you buy good B			
	Endowment	Cost	Benefit	TOTAL	Endowment	Cost	Benefit	TOTAL
			$3 \times n =$				$3 \times n =$	
10	20	-10	30	40	-	-	-	-
9	20	-10	27	37	20	-5	27	42
8	20	-10	24	34	20	-5	24	39
7	20	-10	21	31	20	-5	21	36
6	20	-10	18	28	20	-5	18	33
5	20	-10	15	25	20	-5	15	30
4	20	-10	12	22	20	-5	12	27
3	20	-10	9	19	20	-5	9	24
2	20	-10	6	16	20	-5	6	21
1	20	-10	3	13	20	-5	3	18
0	-	-	-	-	20	-5	0	15

Table 3: Costs and benefits in the VWG experiment with Redistribution

	Payoff	
Endowment	20	20
Your Choice	Product A	Product B
Cost	-10	-5
Benefit (from the choice of the other players)	+3 for each player choosing product A	+3 for each player choosing product A
Redistribution effect	2.5 tokens times the number of players who chooses product B, divided by the number of those who chooses product A	-2.5

Table 4: Players' payoff in the VWG experiment with Redistribution, conditional to other players' choices.

How many players choose good A	When you buy good A					When you buy good B				
	Endowment	Cost	Benefit	Redistribution	TOTAL	Endowment	Cost	Benefit	Redistribution	TOTAL
			$3 \times n =$					$3 \times n =$		
10	20	-10	30	-	40.0	-	-	-		-
9	20	-10	27	0.3	37.3	20	-5	27	-2.5	39.5
8	20	-10	24	0.6	34.6	20	-5	24	-2.5	36.5
7	20	-10	21	1.1	32.1	20	-5	21	-2.5	33.5
6	20	-10	18	1.7	29.7	20	-5	18	-2.5	30.5
5	20	-10	15	2.5	27.5	20	-5	15	-2.5	27.5
4	20	-10	12	3.8	25.8	20	-5	12	-2.5	24.5
3	20	-10	9	5.8	24.8	20	-5	9	-2.5	21.5
2	20	-10	6	10.0	26.0	20	-5	6	-2.5	18.5
1	20	-10	3	22.5	35.5	20	-5	3	-2.5	15.5
0	-	-	-	-	-	20	-5	0	-2.5	12.5

Table 5: Treatments and Sessions.

Treatment	Phase 1 (10 rounds)	Phase 2 (10 rounds)	Phase 3	Subjects no.
BR	Base	Redistribution	Questionnaire	30
RB	Redistribution	Base	Questionnaire	30
BR1	Base Frame 1	Redistribution Frame 1	Questionnaire	30
RB1	Redistribution Frame 1	Base Frame 1	Questionnaire	30
BR2	Base Frame 2	Redistribution Frame 2	Questionnaire	30
RB2	Redistribution Frame 2	Base Frame 2	Questionnaire	30

Appendix 2: Experimental instructions

English Translation	Original Italian
<p>General instructions</p> <p>Welcome and thanks for participating to this experiment.</p> <p>Our goal is to verify the impact of some factors on our decision processes.</p> <p>Together with other participants you will have to take decisions in different situations. Depending of your decisions along with those of the other participants you will get a certain number of points. One among all your decision will be picked randomly and the points you get in that particular situation will be converted in euros (with the exchange rate 2 points = 1 euro) and paid to you in cash. Besides, you will receive 5 points for participating. These points will sum up to those gained during the experiment.</p> <p>Your identity and those of the other participants to the experiment will never be revealed even after the end of the experiment. Also your choices and answers will be dealt with anonymously (without reference to your identity).</p> <p>Overall the experimental session will last approximately one hour.</p> <p>We ask you to work alone and in silence.</p> <p>Thanks for your participation!</p>	<p>Istruzioni Generali</p> <p>Benvenuto e grazie per aver deciso di partecipare a questo studio.</p> <p>Siamo interessati alla comprensione di alcuni fattori che influenzano i nostri processi decisionali.</p> <p>Durante questo studio ti troverai a dover prendere delle decisioni in differenti situazioni. Le tue decisioni insieme alle decisioni prese dagli altri partecipanti allo studio determineranno la vincita di un certo numero di punti. Tra tutte le decisioni che prenderai, una verrà estratta in maniera casuale, e i punti guadagnati in quella situazione verranno convertiti in euro e pagati realmente (tasso di conversione 2 punti = 1 euro). Per la sola partecipazione, poi, riceverai 5 punti che andranno a sommarsi a quelli guadagnati durante la sessione.</p> <p>La tua identità e l'identità degli altri partecipanti non verranno mai svelate, né ora né dopo la fine dello studio. Anche tutte le tue scelte e ogni tua risposta verrà trattata in maniera assolutamente anonima senza nessun riferimento alla tua identità. Nel complesso la sessione durerà approssimativamente un'ora.</p> <p>Ti chiediamo di lavorare da solo e in silenzio.</p> <p>Grazie ancora per la tua partecipazione!</p>

Specific instructions

Base Treatment

In this session you will be asked to choose (for 10 rounds) which, among two products (product A and product B), you intend to buy. For every round you will be given an endowment of 20 points that you will be able to spend to purchase one of the two products. At each round, after your choice and the choices of all other players, we will tell to you and them, without revealing their identity, how many players have chosen product A and product B. After this communication you will play the following round.

Round n

You receive an endowment of 20 points. You must choose whether to buy:

Product A

Product B.

Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

Product B costs 5 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.

The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows: (table 1)

Each of the 10 players is in the same situation as you and faces the same payoff table.

Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table: (table 2)

Please choose:

Product A

Istruzioni specifiche

Trattamento Base

In questa situazione dovrai scegliere ripetutamente (per 10 volte) quale tra due prodotti (prodotto A e prodotto B) acquistare. Ogni volta ti verrà assegnata una certa dotazione di punti che potrai spendere per l'acquisto di uno dei prodotti. Dopo che tu e tutti gli altri avranno scelto, ti verrà comunicato (in maniera anonima) quanti giocatori hanno scelto il prodotto A e quanti il prodotto B prima di giocare nuovamente

Periodo n

Ricevi una dotazione iniziale di 20 punti. Devi decidere se:

Acquistare il prodotto A.

Acquistare il prodotto B.

Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.

Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare il prodotto A.

Le conseguenze (in termini di guadagni) delle due possibili scelte (acquistare il prodotto A o il prodotto B) sono riassunte nella tabella 1 (tabella 1). Ognuno dei 10 partecipanti si trova nella tua stessa situazione e ha la stessa tabella che descrive i guadagni a seconda delle scelte effettuate dagli altri giocatori.

Il tuo guadagno per ognuna delle 10 scelte dipende non solo da quale bene decidi di acquistare tu, ma anche dalle scelte di acquisto che faranno gli altri giocatori, secondo lo schema della tabella 2: (tabella 2)

Quale prodotto scegli?

<p>Product B</p> <p>Redistribution treatment</p> <p>Same as in the Base treatment plus:</p> <p>Notice that, at the end of each round 2.5 points will be subtracted from the payoff of all those participants who have chosen product B. All those point will for a common fund that will equally divided among the participants who have chosen product A.</p> <p>The effect on your payoff of the two players' choices (buying product A or product B) are summarized in the table which follows: (table 3)</p> <p>each of the 10 players is in the same situation as you and faces the same payoff table.</p> <p>Your final payoff from each of the different choices you may make (conditional to other participants' choices) is summarized in the following table: (table 4)</p> <p>Please choose:</p> <p>Product A</p> <p>Product B</p>	<p>Prodotto A</p> <p>Prodotto B</p> <p>Trattamento redistribuzione</p> <p>Come nel trattamento base più:</p> <p>Nota Bene: Rispetto alla situazione precedente però, ora c'è una novità. Ad ogni giocatore che avrà scelto il prodotto B verranno prelevati 2,5 punti che andranno a formare un fondo complessivo che verrà, poi, redistribuito in parti uguali a tutti i giocatori che avranno scelto il prodotto A.</p> <p>Le conseguenze (in termini di guadagni) delle due possibili scelte (acquistare il prodotto A o il prodotto B) sono riassunte nella tabella n.3 (tabella 3). Ognuno dei 10 partecipanti si trova nella tua stessa situazione e ha la stessa tabella che descrive i guadagni a seconda delle scelte effettuate dagli altri giocatori.</p> <p>Il tuo guadagno per ognuna delle 10 scelte dipende non solo da quale bene decidi di acquistare tu, ma anche dalle scelte di acquisto che faranno gli altri giocatori, secondo lo schema della tabella 4 (tabella 4)</p> <p>Quale prodotto scegli?</p> <p>Prodotto A</p> <p>Prodotto B</p>
--	--

Frames

The frames concern a more detailed description of the two products

<p>Frame 1</p> <p>Product A is a ‘energy supply contract’. The company that provides it is committed to:</p> <ul style="list-style-type: none">• spend the 80% of its budget within the region, to generate a positive impact on the local economy, both in term of value creation and higher employment;• employ workers only with permanent employment contract;• train on a regular basis the employees to keep their capabilities and human capital constantly up-to-date. <p>Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.</p> <p>Product B is a ‘energy supply contract’ provided by a company that does not implement any particular form of social responsible conduct. Product B costs 5 points. If you choose product B you will you will receive 3 points for any of the other players choosing to buy product A.</p> <p>Frame 2</p> <p>Product A is a ‘energy supply contract’. The company that provides it, is committed to devote each year a share of its profits to fund a number</p>	<p>Frame 1</p> <p>Il prodotto A è un contratto di fornitura di energia elettrica. L’impresa che lo propone si impegna a:</p> <ul style="list-style-type: none">• sostenere l’80% dei suoi costi nel territorio regionale, con una ricaduta positiva sul tessuto economico e sull’occupazione locale;• ad assumere i dipendenti solo con contratti a tempo indeterminato;• a formare regolarmente i propri dipendenti per mantenerne elevate le loro competenze ed il capitale umano. <p>Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.</p> <p>Il prodotto B è un contratto di fornitura di energia elettrica tradizionale. L’impresa che lo propone non evidenzia nessuna forma di responsabilità sociale. Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare il prodotto A</p> <p>Frame 2</p> <p>Il prodotto A è un contratto di fornitura di energia elettrica. L’impresa che lo propone si</p>
--	---

<p>of high social impact projects. A national call will attract socially oriented projects that will be selected through a voting process among the company clients.</p> <p>Product A costs 10 points. If you buy product A you will receive 3 points for any of the other players choosing to buy product A.</p> <p>Product B is a 'energy supply contract' provided by a company that does not implement any particular form of social responsible conduct. Product B costs 5 points. If you choose product B you will you will receive 3 points for any of the other players choosing to buy product A.</p>	<p>impegna a destinare ogni anno una quota dei profitti per il finanziamento di progetti ad alto impatto sociale. Un bando prevederà le modalità di partecipazione dei vari progetti di utilità sociale che verranno poi votati da tutti gli utenti della società elettrica.</p> <p>Il prodotto A costa 10 punti. Acquistando il prodotto A otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A.</p> <p>Il prodotto B è un contratto di fornitura di energia elettrica tradizionale. L'impresa che lo propone non evidenzia nessuna forma di responsabilità sociale. I</p> <p>Il prodotto B costa 5 punti. Acquistando il prodotto B otterrai 3 punti per ognuno degli altri giocatori che, nel tuo gruppo, ha scelto di acquistare come te il prodotto A</p>
--	--

Appendix 3: Post-Experimental Questionnaire

21. Gender

22. Age

23. Place of residence

24. Housing condition:

a. Living alone

b. Living with family

c. Living with other people (non family)

25. Father education

a. Primary School

b. Middle School

c. Upper Intermediate/High school

d. University degree

e. Other

26. Mother education

a. Primary School

b. Middle School

c. Upper Intermediate/High school

d. University degree

e. Other

27. Father professional status

a. Self employed

b. Clerk

- c. Manual worker
- d. Executive
- e. Retired
- f. House activity
- g. Student
- h. Entrepreneur
- i. Unemployed
- j. Other

28. Mother professional status

- a. Self employed
- b. Clerk
- c. Manual worker
- d. Executive
- e. Retired
- f. House activity
- g. Student
- h. Entrepreneur
- i. Unemployed
- j. Other

29. Number of people in the household (including yourself)

30. Are you or members of your family actively involved in volunteering organizations?

31. Are you or members of your family actively involved in environmental organizations?

32. Whom do you buy your electricity from?

33. Does your house/apartment is provided with any of the following technologies?

- a. Solar panels
- b. Other solar thermal technologies
- c. Pellet stoves

34. Your family's yearly net income (year 2014):

- a. < 15.000
- b. 15.001 - 25.000
- c. 25.001 - 35.000
- d. 35.001 - 50.000
- e. 50.001 - 90.000
- f. > 90.000

Use this scale to answer the following questions

Not at all=0 Completely satisfied=10

- 35. How much do you feel satisfied about what you experienced during this experiment?
- 36. How much do you feel satisfied about others' participant behavior in the games?
- 37. How much do you feel satisfied about your behavior in the game?
- 38. Generally speaking how much do you think you can trust others
- 39. To what extent are you satisfied with your life in general?
- 40. To what extent are you satisfied with your life in financial situation?
- 41. Using a scale (-5 = left , 0 center, +5 right) how would you define your political preferences?