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Intuitive cooperation in The Hague
A natural field experiment

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Abstract

Cooperation is at the centre of human nature and at the heart of social transformations. Grasping how strangers cooperate and behave with each other may permit a better understanding of the way societies function and can develop as they modernize. To advance this comprehension, this study examines whether humans are naturally predisposed towards cooperation or selfishness, and how their behavior changes when people have more time to think. To answer these questions, the study implements an original natural field experiment which exogenously varies response times (through average human walking time) to analyze the intuitive and rational underpinnings of human behavior. The experimental findings suggest that while humans are naturally inclined to help each other, they start behaving more selfishly as thinking time increases. There is also clear evidence that humans are prone to withhold help when strangers violate social norms and the likelihood of such indirect punishment increases when they have more time to think.

Keywords

Cooperation, natural field experiment, dual-reasoning, The Hague.

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Acronyms

NFE	Natural Field Experiment
NL	The Netherlands
PGGs	Public Good Games

Intuitive cooperation in The Hague[1]

1 Introduction

This research paper studies the nature of human cooperation. The study of human cooperation is important as modern societies are characterized by numerous encounters between strangers, where every individual has to pay a personal cost to help another person. In this sense, this research seeks to answer the following questions: Are humans intrinsically predisposed to altruistically cooperate with others or to selfishly refuse help? Do humans shift these innate predispositions after balancing their moral obligations with their personal costs of helping?

With these main questions in mind, the present study adopts a dual-reasoning framework to design an original natural field experiment in cooperation. The idea behind the dual-reasoning framework is that humans are able to examine information and make decisions via two processes. "Thinking intuitively" is the first process. It is linked to those faster and unconscious decisions based on prior experience, beliefs and instinct. "Thinking rationally" is the second process. It is linked to those slower and more rational decisions, for instance, after analyzing the costs and benefits of undertaking a specific action. Therefore, by studying these processes in human cooperation, the preset research attempts to answer the aforementioned questions.

Several laboratory experiments have revealed insights on these questions. Researchers have examined the decision to cooperate using particular experimental games. These games examine whether participants of an experiment altruistically cooperate with each other or selfishly deflect

[1] The results of this research paper are an expression of my appreciation to many special people. First and foremost, I would like to express my greatest gratitude to my supervisor and mentor in experimental economics Prof. Matthias Rieger. His advises and teachings will support my future research and my academic life. Second, I am truly thankful to Prof. Arjun Bedi. I will always cherish his guidance and critical feedback during this process. His suggestions have encouraged me to pursue the best possible quality of research.

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cooperation. In addition, by using limits on response times, these games are also able to stimulate participants to make faster and slower decisions, encouraging intuitive and rational thinking, respectively. In an early study, Rand et al. (2012) find that humans are naturally predisposed towards cooperation, but tend to behave more selfish as thinking time increases. However, these initial results have been contested in later replications.

Two subsequent replications have obtained different results. Tinghög et al. (2013) replicate Rand et al. (2012) through five laboratory experiments. They find no causal effect of time on the decisions to cooperate. Thus, the results of this second paper suggests that humans do not reveal any distinctive predisposition towards altruism or selfishness, nor does the study find that decisions change when individuals have additional time to think. Subsequently, Recalde et al. (2015) evaluates how confusion and error of the participants could affect the experimental results. With this hypothesis in mind, this third paper adjusts the dominant strategy of the games, finding that variations in the rates of cooperation are a consequence of human mistake. The researches argue that cooperative outcomes may be a consequence of forcing participants to decide extremely quickly rather than an actual innate predisposition to cooperate.

Considering the mixed evidence, this research proposes a novel natural field experiment to assess these questions without the artificiality of laboratory experiments. The experiment uses actors to elicit cooperation while at the same time varies response times. The actor represents a typical citizen of the society. Thus, by randomly assigning participants to the experimental treatments, the proposed methodology is able to answer the main question of this study and to offer inferences about the population under analysis. Finally, due to the ideal characteristics of the location, the experiment is conducted in the main sidewalk of Park Malieveld in The Hague, The Netherlands (NL).

In addition to examine human cooperation, the experiment also scrutinizes two additional issues. First, it investigates on the natural state of man to punish individuals that fail to follow social norms. To investigate this question, the study evaluates indirect punishment, testing whether humans are innately inclined to withhold help to norm-violators; and, whether people tend to punish more when they have more time to think. Second, the study aims to answer whether the gender of the actor influence the decision to cooperate or punish.

To answer the aforementioned questions, this paper contributes to the existing literature in several ways. A general contribution is that it explores the nature of human cooperation, the ways in which humans interact with each other and make decisions. In this sense, the study can distinguish whether humans are naturally altruistic or selfish with strangers, and whether they shift their innate behavior when thinking more carefully about the personal costs of helping and their moral and social obligations.

Furthermore, the proposed methodology possesses four novelties to the literature on experimental and behavioral economics. First, the study proposes a helping-norm as a real-life approximation of the PGGs. Second, this study

designs an original natural field experiment to assess the propensities to cooperate via "intuitive thinking" and "rational thinking". Third, this work evaluates these two processes of thinking on punitive behavior. Fourth and lastly, by forcing the participants to pay a cost in terms of time and effort to help, the experimental design diminishes the mistakes and confusion found in previous laboratory experiments.

To preview the results, the study finds a causal effect of thinking time on social behavior. The findings suggest that the citizens of The Hague are naturally predisposed to cooperate with other members of the community, but they behave more selfish as they have more time to think. In particular, the propensity to cooperate declines from 72 percentage points (pp) to 52 pp between faster and slower decisions, respectively. The results remain stable after controlling for the gender of the individual that needs help (actor). Compared to previous studies, the results of this paper are similar to Rand et al. (2012), but different from Tinghög et al. (2013). For the case of indirect punishment, the findings suggest that the citizens of The Hague are naturally predisposed to withhold help if individuals fail to follow social norms, and that that increase the punishment in time. Analogously to Balaoufas et al. (2014), this paper finds an "intuitive" indirect punishment close to 20 pp; but it also finds additional evidence that individual increase the punishment up to 36 pp as time increases. In addition, results suggest that males inflict an extra punishment of 26p.p on other male-violators. Lastly and more importantly, econometric analysis and robustness checks confirm these results.

This study also opens avenues for future research: Participants have different capabilities to process information. This study provides average effects across individuals, but some participants may decide faster or slower independently of treatment exposure. Future research could investigate heterogeneous effects by cognitive processing speeds of individuals. As a related topic, it would be interesting to replicate the experiments across different societies and settings to evaluate regional and contextual differences.

The present paper is organized as follows. Chapter 2 reviews the most relevant literature. Chapter 3 motivates the empirical strategy used in this research. Chapter 4 describes the experimental data gathered. Chapter 5 presents the results. Chapter 6 compares the results with previous literature, discussing implications and opportunities for future research. Finally, Chapter 7 outlines the main conclusions of the study.

2 Literature review

This chapter has three objectives. The first objective is to define the two processes of human reasoning and link them to human cooperation. The second objective is to describe how the concept of cooperation between individuals can be conceived as a public good in modern societies. For this purpose, the chapter reviews the existing empirical studies using public good games. Last but not least, the third objective is to outline the benefits of using natural field experiments for social research.

2.1 Two processes of reasoning in human behaviour

Initial hints about two processes of reasoning in human behavior can be found since the Ancient Greeks. They debated how humans suffer from inner personal conflicts when making decisions that involve actions of self-sacrifice and self-interest (Frankish & Evans, 2009). What is more, they contrasted two ways in which humans make decisions. While "desires and spontaneity" drive different shortsighted, emotional and passionate decisions; "reasoning and wisdom" drive more analytical and carefully taken decisions (Loewenstein & O'Donoghue, 2004). However, once the influence of the Greek civilization decreased, the aforementioned discussions were postponed until most recent times.

It was not until the Industrial Revolution when Adam Smith (1759) regained the intellectual interest in these debates. In his *Theory of Moral Sentiments*, he emphasized how individuals make decisions in two ways; discussing that while some decisions are spontaneous, impulsive and emotional, others are more dispassionate and moderated. In particular, he argued that while the former are guided by instincts and emotions (what he describes as "animal spirits"), the latter evaluate the moral norms and standards of the society to make more impartial decisions (what A. Smith mentions as an "impartial spectator") (Loewenstein & O'Donoghue, 2004; Albanese, 2006; Kaufman, 2006). Remarkably enough, subsequent advances in Psychology and Neuroscience would confirm these old philosophical ideas by giving a more scientific perspective.

In the course of time, and, more specifically, during the Twentieth Century, Psychology confirmed the presence of two types of human reasoning. Chaiken and Trope (1999), and more recently Kahneman (2012) explains how humans make all social and economic decisions through conscious and unconscious processes. To provide a more straightforward illustration, Metcalfe and Mischel (1999) exemplify these decisions through a set of "hot and cold" systems. Whereas the "hot system" encourages spontaneous, impulsive and emotional behaviors; the "cold system" develops more controlled and rational behaviors, but only after the situation is analyzed more calmly. In this manner, the study of these two systems have become of primary importance to analyze social behavior.

Furthermore, recent advances in Neuroscience have confirmed the existence of these two types of human reasoning. By the end of the Twentieth Century, Neuroscience revealed that two brain systems shape the way modern humans make decisions. Cory (2006)[2] mentions how the application of sophisticated neurological techniques[3] has exposed the presence of three brain systems: an older affectional program, a younger self-preservation program and an executive program. More importantly, each of these programs drive particular behaviors. On one side, the affectional program is strongly activated

[2] The author explains this evidence using the Conflicts System Neuro-behavioral Model.

[3] Such as functional magnetic resonance imaging.

when humans undertake social activities and requires less time to work. Thus, this program triggers more impulsive, emotional and unconscious behaviors. On another side, the self-preservation program is activated when humans convey more analytical activities and requires more time and effort to work. Thus, this program encourages more conscious, rational and controlled behaviors. Lastly, the executive program implements the final decisions. Therefore, this evidence has clarified the presence of two processes of human reasoning.

Following the aforementioned developments, academia deepen the analysis of these two processes with the purpose to explain how they shape human behavior. In particular, Kahneman (2012) distinguishes them as: "System-1" and "System-2". Intuition guides the decisions of the "System-1", encouraging more instinctive and automatic behaviors. "Thinking intuitively" is used when individuals do not have enough time to decide which the correct decision is or do not want to over think it. Intuition is in charge to find quick answers to very complex or uncertain situations. Thus, the decisions of the "System-1" are conventionally described as "fast, effortless, affective, nonverbal and rapid" (Frantz, 2006; Kahneman, 2012). Evans and Stanovich (2013) mention that intuition is based in preexisting knowledge and beliefs; and as a consequence, "thinking intuitively" contrasts to the "System-2": "thinking rationally".

Table 1
Features of "intuitive thinking" and "rational thinking"

Type-1 process (intuition)	Type-2 process (rational)
Fast	Slow
Automatic	Capacity limited
Biased responses	Conscious
Experience-based	Normative responses
High capacity	Abstract
Independent of cognitive ability	Controlled
Non-conscious	Rule-based
Contextualized	Consequential decision making
Parallel	Correlates with cognitive ability
System-1 (old brain structure)	**System-2 (new brain structure)**
Evolved early	Evolved late
Similar to animal cognition	Distinctively human
Implicit knowledge	Explicit knowledge
Basic emotions	Complex emotions

Source: Figure taken from Evans and Stanovich (2013)

Kahneman (2012) mentions that "System-2" promotes higher levels of rational thinking. The decisions of this second system are implemented once the "intuitive decisions" of the "Type-1" system have been assessed and rejected as valid behaviors for the given situation (Frantz, 2006; Rieskamp et al.

2006; Kaufman, 2006). In this sense, "thinking rationally" is also referred to those "slower, controlled, rule-based, analytical and reflective" decisions (Frantz, 2006; Kahneman, 2012). Despite the increase in rational analysis, the cognitive capabilities of each individual limit the spectrum of potential decisions to be taken (Johnson et al. 2014). Considering the contrasting characteristics between "thinking intuitively" and "thinking rationally", these processes have been also categorized as "dual-processes of human reasoning" and "dual-reasoning processes" (Evans & Stanovich, 2013). Table 1 characterizes the distinctive features of these two processes.

These findings have encouraged innovative research in many fields. In particular, to the Economic Science, these findings have illuminated how cognition explains how and why individuals make particular economic and social decisions. For instance, its study enables the recognition of the mechanisms by which humans consume, invest and cooperate. [4] The present study is interested in the relation between cognition and the latter in human behavior.

Loewenstein and O'Donoghue (2004) formulates a suitable framework on how dual-reasoning can influence human behavior. In this framework, the speed of each situation and the analytical capabilities of each individual drive their intuitive and rational decisions. The authors mention that intuition is emotional and automatic in nature. Thus, intuition can encourage sudden and extremes decisions of altruism or selfishness. Meanwhile, rational decisions are more goal-oriented and circumstantial. Thus, they are able to assess the costs and benefits of adopting a specific behavior in a given situation. For instance, rational decisions could balance the moral and social obligations with the personal costs of carrying out a specific behavior. Accordingly, rational decisions could resemble the intuitive decisions or could completely contest them (Loewenstein and O'Donoghue, 2004). In this manner, this model is able to bridge the link between the two forms of human reasoning with social behavior[5].

Studying the influence of cognition in social behavior can improve the understanding of human cooperation. In particular, encouraging intuition enables the recognition of whether humans are naturally predisposed to be selfish or altruistic to other members. Meanwhile, studying rational decisions clarifies whether individuals shift their naturally predisposed behaviors with

[4] Likewise, these advances have break the ground for the nascent field of neuro-economics. This field researches on how brain structures and neuro-transmissors influence decision making processes (Fehr & Rangel, 2011; Glimcher & Fehr, 2014).

[5] These conceptions have been embraced and expanded by further frameworks. Lynne (2006) proposes that individuals make decisions based on social and private preferences. The framework comprises a utility function that maximizes social decisions (about the well-being of the others) and egoistic decisions (about the best self-interest for the individual). In the process of taking every decision, an individual has to balance his/her interests with the interests of the others, weighting his/her own survival with the harmony of the society. At equilibrium, the behavior of an individual would ensure self-preservation and social harmony.

more careful thinking. For instance, after weighting the moral and social obligations with their own best self-interested action.

As it is explained in the following section 2.2, recent laboratory experiments have contributed in this type of research using Public Good Games (PGGs). These experimental games approximate decisions to cooperate to public goods, enabling the study of altruism and selfishness in human cooperation. Moreover, the application of limits on response times to promote intuitive and rational decisions, enabling the research on how humans are naturally inclined towards altruism or selfishness; and, how rational thinking could modify their innate decisions (Rand et al. 2012; Rand et al. 2014). The following section reviews theoretical and empirical literature on this matter.

2.2 Dual-reasoning in cooperation: evidence of altruism and selfishness using public good games

The aim of this section is threefold. The first aim of this section is to define human cooperation as a public good in modern societies. The second aim is to describe the methodology of Public Good Games and to outline how they emulate decisions to cooperate in laboratory experiments. The third aim is to examine recent empirical evidence on Public Good Games, reviewing their insights for the current research.

Cooperation as a public good: a proxy for altruistic and selfish behaviors in modern societies

Human cooperation is unique in modern societies as each individual has to pay a personal cost to benefit another human being (Nowak, 2006; Rand & Nowak, 2013). Particularly, if all members of a society choose to cooperate, the whole society is better off. In this process, the members of the society strengthen common ties, trust and social networking which boosts socioeconomic efficiency in the short run and economic development in the long run (Putnam, 1993; Helliwell & Puntnam, 1995; Rand & Nowak, 2013).

The relationship between human cooperation, social capital[6] and economic improvement is multifaceted. Initially, cooperation boosts social capital through advancements in social trust and networking among the members of a group (Nguyen & Rieger, 2014). Leonard et al. (2010) describe that positive exchanges between members of a community improve their trust, values, group spirit and social cohesion. These upgrades (in social capital) inspire individuals to act more effectively among themselves, improving the efficiency and well-being at the aggregate levels, boosting economic advancing (Putnam, 1993; Helliwell & Puntnam, 1995; Ludwig et al, 2007).

[6] Putnam (1993) describes social capital as the "trust, norms and networks that inspire intra-group cooperation and coordination" for the mutual benefit of all its members.

Conversely, social capital preserves and strengthens intra-group cooperation through the enforcement of the social norms[7] by which individuals coexist in their community (Nguyen & Rieger, 2014). The enforcement of social norms preserves the rules of the community and secures the wellbeing and prosperity of the society (Putnam, 1993; Champlin, 1999; Kay, 2006). For instance, the social norm of cooperation motivates an individual to help another for the amelioration of their community. The enforcement of the norm of cooperation improves social capital through the increase in trust and social cohesion, strengthening its own preservation in this manner (Putnam, 1993; Helliwell & Puntnam, 1995; Kaul & Grunberg, 1999; Miguel; 2004; Akerlof & Kranton, 2010).

Considering those attributions, the cooperation-norm can be characterized as a public good in modern societies (Champlin, 1999; Nowak, 2006; Rand & Novak, 2013). According to the classic public goods theory, this conception is valid as cooperation is non-rivalrous and non-excludable. First, it is non-rivalrous as the cooperation of one individual does not limit the cooperation of another individual. Instead, all individuals are able to enjoy the benefits of the service without interfering with the benefits of the other members (Holcombe, 1997; Champlin, 1999; Cowen, 2008). Second, cooperation is "non-excludable" as it is not possible to exclude an individual from the help given by another member. In this sense, all the members of a society are able to benefit if every individual decides to enforce (and preserve) the norm of cooperating to each other (Holcombe, 1997; Champlin, 1999; Cowen, 2008).

Nevertheless, the personal costs of enforcing the norm of cooperation provide incentives to free-ride. Considering the time and effort to assist another member, individuals have incentives to refuse cooperation and free ride on the generosity of the other members (Putnam, 1993; Champlin, 1999; Nowak, 2006; Rand & Novak, 2013). In particular, as it is not possible to exclude the individuals that do not cooperate nor to charge for the service, individuals can refuse to cooperate without stop receiving the benefits of the norm (Holcombe; 1997; Cowen, 2008; Nguyen & Rieger, 2014).

Accordingly, enforcing the norm of cooperation comprises a decision between altruism and selfishness. As norm-deflectors are able to obtain the benefits without paying the personal costs, free riding on the cooperation of the other members becomes the best self-interested strategy. While the decision to cooperate approximates altruism, refusing to follow the norm of cooperation is taken as a proxy for selfishness (Nowak, 2006; Rand et al, 2012; Rand et al, 2014).

Reciprocity effects can play an important role in the decisions to cooperate. These effects are strongly present when two individuals know each other or when there is a high probability of a future encounter (Nowak, 2006;

[7] Social norms comprise the "rules, values and beliefs" that govern the conduct of a community. Social norms delimit social functions, motivate positive behaviors and discourage inappropriate ones. Hence, they influence the efficiency of the social relations and the economic interactions of every society (Stanford Encyclopedia of Philosophy, 2015).

Tyler, 2008; Rand & Nowak, 2013). More specifically, an individual may decide to cooperate with the other just to follow a broader self-interested strategy. This happens as the individual knows he/she may need help from the second person in the foreseeable future and not helping (now) decreases the likelihood of that event. In other words, the individuals would help just because he/she knows that by not helping the second individual, he/she might be affecting himself/herself in the future (Nowak, 2006; Rand & Novak, 2013). In this way, reciprocity effects influence human cooperation; cooperating not because of innate altruism, but because of a desire to maximize personal benefits in the future.

Likewise, social pressures can drive the enforcement of the norm of cooperation through fame incentives or personal motives (Champlin, 1999; Tyler, 2008). In the first case, an individual could cooperate with the sole purpose to seek recognition and admiration from other members. In the second case, an individual could cooperate as a consequence of peer pressure or feelings of guilt. Both of these cases affect the motivations of individuals, distorting the correct analysis of the nature of human cooperation.

The enforcement of the helping-norm conveys a practical example of the cooperation-norm. First, all members of the society are better-off when all members preserve the norm by helping each other (Putnam, 1995). Thus, members have the moral and social obligation to follow the social norm of helping each other. Nevertheless, an individual is tempted to refuse help to avoid paying the personal costs of helping (in terms of time and effort). These costs incentivize members to deflect assistance and free ride on the help that the other members give. Moreover, reciprocity effects and social pressures can also readjust the intrinsic motivations of the members (Nowak, 2006).

Considering its dual motives, studying the norm of cooperation can improve the understanding of human nature and social behavior. By eliminating reciprocity effects and social pressures, the decisions to enforce the cooperation-norm (i.e. helping-norm) can provide insights on the levels of altruism and selfishness of individuals of modern societies. For instance, while a strong enforcement of the norm of cooperation indicates high levels of altruism and low levels of selfishness among the individuals of a society, its weak enforcement would indicate low levels of altruism and high levels of selfishness (Gächter, 2012). Based on these trade-offs, recent laboratory experiments have designed Public Good Games to study these concerns.

Public good games in laboratory experiments

Researchers use Public Goods Games (PGGs) to analyze the levels of cooperation between individuals. These games evaluate the willingness to contribute to a public good, providing appropriate measures of the levels of altruism and selfishness of the participants. At the macro level, these games emulate the decisions to cooperate between strangers of modern societies (Andreoni, 1995; Anderson et al. 2004; Capraro et al. 2014).

PPGs emulate the decisions to cooperate to a public good. Each game starts by clustering participants into small groups[8] and giving a fix amount of money to each member. Then, the game gives each participant a "one-time opportunity" to contribute (partially or totally) to a "public pot" or to keep the money (Fehr & Gächter, 2000; Fischbacher et al. 2001; Recalde et al. 2015). Prior to this decision, every member is informed that the total amount of contributions in the public pot will be multiplied (by a factor greater than one but lower than the number of participants) and divided equally among the group. Furthermore, each member makes a private and anonymous decision. This is done to avoid social pressures and reciprocity effects that may distort their true responses (Fehr & Gächter, 2000; Fischbacher et al. 2001). Therefore, these games comprise "one-time decisions between strangers of a group".

If every participant decides to contribute to the "public pot" with his/her full amount, the entire group will be better off. This happens as the total amount is multiplied by a factor greater than one and shared equally among the members. Nonetheless, if they realize the unlikeliness of this outcome, each participant has private incentives not to contribute and free ride on the cooperation of the others that do contribute (Fehr & Gächter, 2000; Fischbacher et al. 2001). Therefore, members have to decide between the aggregate benefits of cooperating to the public pot with their best self-interested strategy of free-riding on the generosity of the others.

Evidence of dual-reasoning in public good games

Recent laboratory experiments have used Public Good Games to provide empirical insights on the altruistic and selfish inclinations of humans. Rand et al. (2012) provide a first evidence on this subject using limits on response time to evaluate the influence of intuitive and rational thinking in the level of contributions to the public pot[9]. More specifically, the experiment forced participants to make decisions based on two time-treatments. The first "time-pressured" treatment forced them to make decisions before 10 seconds. This condition encourages intuitive thinking. Conversely, the second "time-delayed" treatment required participants to wait at least 10 seconds. This condition encourages rational thinking.

As suggested by the title of the paper, '*Spontaneous giving and calculated greed*', the results suggest that humans are naturally altruistic with other members of their group. However, humans become more self-interested and refuse to cooperate as they undertake more rational thinking (Rand et al, 2012). Figure 1

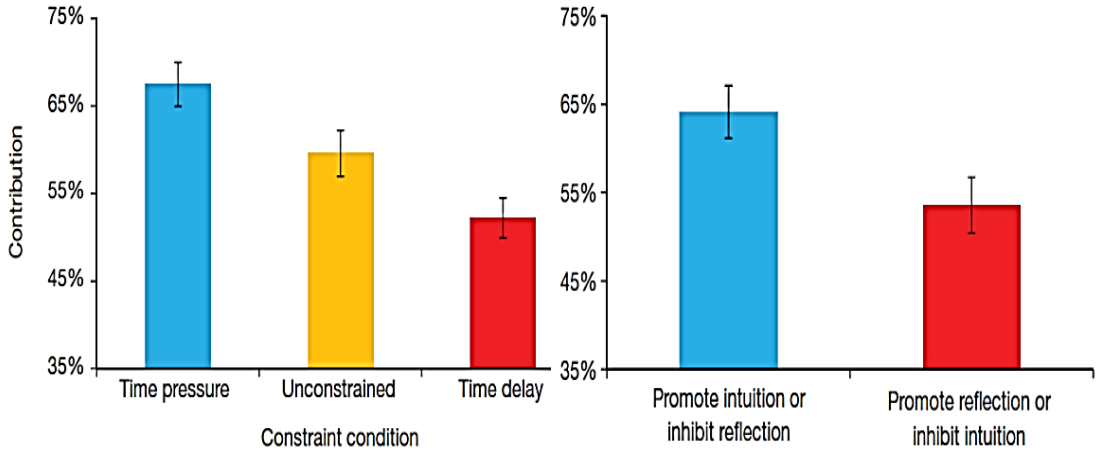
[8] Typically, the participant groups are formed with four or five undergraduate students.

[9] Rubinstein (2007) argues that shorter times promote intuitive thinking. Shorter times encourage instinctive and emotional decisions rooted in prior knowledge, experience and default belief. Meanwhile, longer times promote rational thinking. Longer times encourage a more careful assessment of each situation. This technique has been used to study decisions related to consumer behavior, time preferences and cooperation (Piovesan & Wengström, 2009).

illustrates the general findings of this paper. Moreover, this first paper provides a starting point for the methodological approach followed in the present study and conveys evidence that decisions made under "time pressure" experience higher levels of contribution than those in "time delay".

Considering the evidence of the first paper, Tinghög et al. (2013) replicate the study in four different experiments without confirming the initial findings. The four replications include one prisoner's dilemma (#1) and three public good games (#2 to #4) shown in Figure 2. Additionally, with the objective to minimize missing values[10], the replication evaluated the decisions to cooperate as binary decisions. More importantly, and, in contrast to the former findings, this second paper does not find causal effects of time on the rates of cooperation: Humans do not reflect systematic tendencies towards altruism or selfishness as a function of time. Despite this evidence, Rand et al. (2013) discusses the differences in the experimental designs (between their first study and Tinghög's replication) that could vary the findings.

Figure 1
Thinking intuitively promotes cooperation

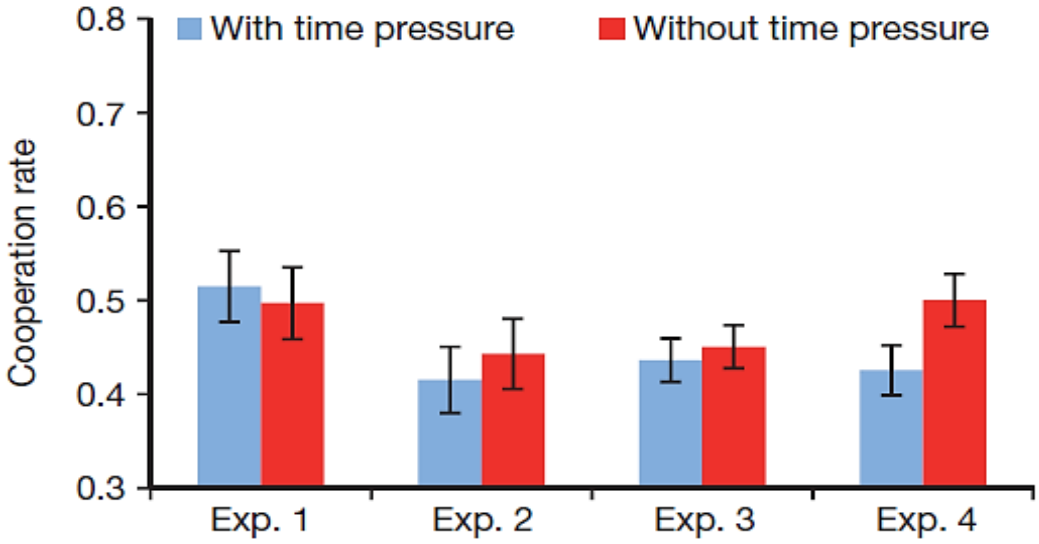


Source: Figure taken from Rand et al. (2012)

Accordingly, the aforementioned study contributes to the present research in two key aspects. First, it improves the specification of the empirical strategy: it assesses the decision to cooperate as a binary choice (i.e. cooperates=1/deflects=0). Second, it provides empirical evidence that contrasts the first paper, motivating the discussion about this type of research.

[10] More specifically, the choice is set as "0" if the contribution to the pot is less than the money kept privately, and, the choice is set as "1" if the contribution to the pot is higher than the money that is kept privately.

Figure 2
Replications on intuitive cooperation



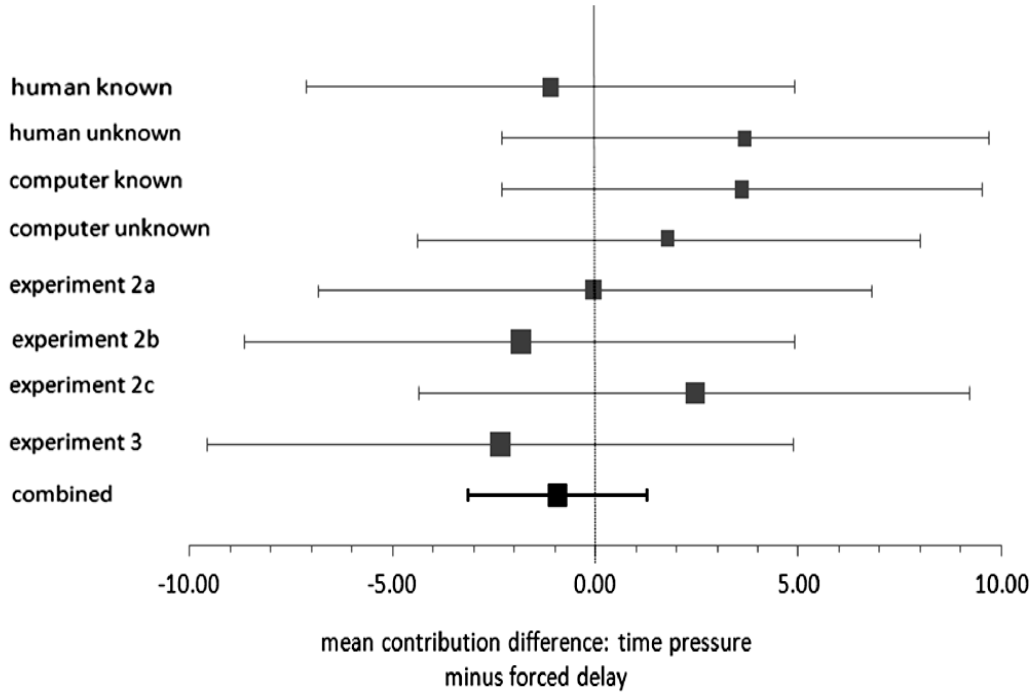
Source: Figure taken from Tinghög et al. (2013)

Considering its initial findings, Rand et al. (2014) analyze the evidence of time-pressure and time-delayed responses on 15 different experimental studies over a period of two-years. In these studies, the researchers find that pressure increases in 21 pp the likelihood to cooperate. Thus, this evidence suggests that selfishness increases in time. In addition, this paper proposes the Social Heuristic Hypothesis which theorizes that intuition would tend to be more cooperative (than rational behaviors) in those situations where selfishness is the optimal strategy for an individual. However, the individual would readjust his/her default decision to match the best-self-interested strategy as thinking time increases. Furthermore, Rand et al. (2014) discuss that intuition could have stronger effects on cooperation in societies where is advantageous to cooperate in daily life activities. Thus, this paper also proposes that *experience* could act as a further mechanism. Therefore, this paper contributes in two ways to the current research; first, it conveys additional evidence on the questions of the present analysis; and second, it improves the understanding of the decision-making processes underpinning human cooperation.

Verkoeijen & Bouwmeester (2014) develop a further study on the topic. The researchers recreate eight different PPGs. Four experiments manipulate the knowledge about the contributions of the other participants (known or unknown), the identity of the other participants (humans or computer) and the limits on time to decide (time pressure or time delay). The first four lines of Figure 3 show these results. Additionally, four other tests evaluate the role of participants' experience (Experiments 2 (a,b,c) and Experiment 3 in Figure 3). Interestingly, the results of all eight experiments did not find any clear effect of time on human behavior. More importantly, the combined effect (of the eight experiments) does not reflect a statistically significant effect of time (last line of Figure 3). Considering this evidence, this paper is consider to be of significant

importance to expand the evidence of the relationship between thinking time, human cooperation and social behavior.

Figure 3
Mean difference between time-pressured and time-delayed conditions



Note: The grey lines represent the 95% confidence intervals of the (mean) difference between time-pressured and time-delayed decisions. The last row reflects the combined effect of all eight experiments. All lines show no clear influence of time on human cooperation.
Source: Figure taken from Verkoeijen & Bouwmeester (2014)

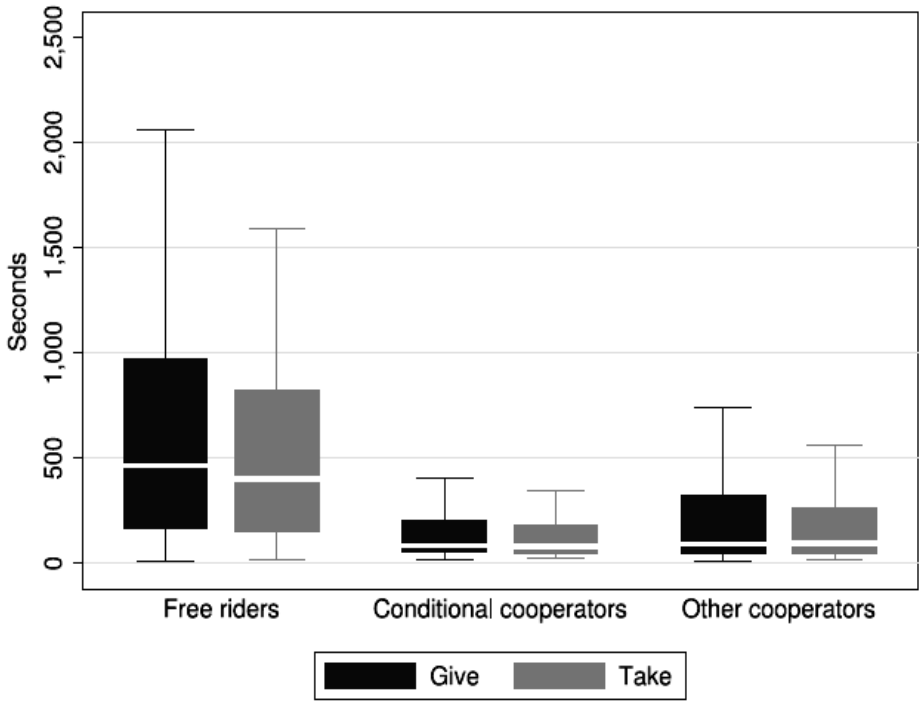
Likewise, Nielsen et al. (2014) study a large-scale PPG. Based on participant's behavior, the paper classifies them as free riders, conditional cooperators and other cooperators[11]. As shown in Figure 4, the results suggest that free riders require more time to reach a decision when compared to the other participants. The study argues that conditional cooperation is seen as a social norm and, therefore, free riders need additional time to solve a moral dilemma: to preserve the norm of cooperation (despite their personal cost) or refuse cooperation (following their best self-interested strategy). In this sense, free riders experience "second thoughts", leading them to free ride on the generosity of the others. Hence, Nielsen et al. (2014) is important to provide

[11] "Free riders" comprise those participants that do not contribute to the public pot. "Conditional cooperators" gathers those participants that increase contributors after other participants contribute first. Thus, they become cooperators "conditional" on the cooperation of others. Finally, "other cooperators" include all other participants who always contribute independently of the decisions of the other participants.

additional evidence supporting the findings of the initial study and to identify the vast recent literature developed in this nascent field of research.

Furthermore, Recalde et al. (2014), and more recently Recalde et al. (2015), publish two other studies on this matter. These papers readjusts the dominant strategy of the PGGs to account for human error and confusion when making decisions ("clicking") in laboratory settings. Their results propose that the increase in cooperation and generosity (of the time-pressured treatment) is a consequence of confusion as participants are severely hurried to "click" fast. Thus, the difference is not a consequence of innate generosity to other members, but because of mistake. Therefore, these two papers are important to outline the existing limitations of laboratory experiments when researching on these questions.

Figure 4
Response times per classification of participants



Note: Boxplots of response time of participants. The white line of the box plot displays the mean.
Source: Figure taken from Nielsen et al. (2014)

Considering the mixed literature from laboratory experiments, the present study designs a natural experiment in the field. A natural field experiment is preferred for two general reasons. First, it assesses the behavior of participants in more truthful manners. Second, it minimizes the likelihood of human error and confusion. More importantly, based on the knowledge and the research that the author has conducted, there are no studies assessing dual-reasoning in a natural field experiment on human cooperation at the moment of the elaboration of this research paper.

2.3 Beyond the lab: advantages of natural experiments for social research

Natural experiments provide an ideal technique to examine individual and social behavior. List (2007) mentions that natural experiments evaluate more truthful responses as participants are not aware that their decisions are being assessed. Thus, they reveal enriched and more honest responses than those responses made in artificial atmospheres such as surveys, interviews or laboratory experiments. Additionally, natural experiments are able to minimize biases in the selection of participants if they are developed in appropriate locations. For all of these reasons, the results of natural experiments have external validity. (List, 2007; List, 2011; Stilgoe, 2012).

Several studies use natural field experiments to research on charitable giving, norm enforcement, reputation and cooperation[12]. Two of these studies are particularly relevant for the present work. First, Balafoutas et al. (2012) studies the willingness to enforce two social efficiency-enhancing norms: the non-littering norm and the escalator's norm[13]. Using actors to recreate the natural phenomenon, the researches violate these two social norms to examine the likeliness of people to enforce them. To minimize selection biases, the experiment took place in the central train station of Athens (Greece). In this sense, this first study is important to propose a clear methodological approach on natural field experiments and to give empirical evidence of the enforcement of social norms between strangers of a similar society.

Second, Balafoutas et al. (2014) studies the propensities to punish individuals that violate social norms[14]. For this purpose, the study distinguishes between direct punishment and indirect punishment. In particular, while direct punishment comprises a direct rebuke on the norm-violator; indirect punishment reprimands him/her by withholding help that would have been given (without the violation of the social norm). Thus, this study is important for the present research in three ways. First, it improves the methodological strategy to undertake natural field experiments. Second, it identifies a second social behavior that would be interesting to include in the present research: (indirect) punishment. Third and last, it suggests the assessment of punitive behavior by breaking the non-littering norm.

Based on the literature discussed in this chapter, the present study links methodologies used in natural and laboratory experiments to answer its fundamental questions. By doing so, this work bridges methodologies such as natural field experiments and response times with recent studies on human

[12] Review List & Luck-Reiley (2002); Frey & Meier (2004); Falk (2004); Martin & Randal (2005); Yoeli et al. (2013); Alpizar et al. (2008); Shangan & Croson (2009); Zhang & Zhu (2010) and Karlan & McConnell (2014).

[13] The non-littering norm comprises the norm of "not polluting a public space". The escalator norm involves the norm of "standing in the right and walking in the left of escalators".

[14] Those individuals that fail to follow the norms of the society.

cooperation and dual-processes of human reasoning. The following section explains the empirical strategies used in the present research.

3 Empirical strategy

This chapter explains the three methodological strategies used in this study. The main strategy proposes a natural field experiment to examine the two processes of human reasoning in the decisions to cooperate with a public good. The second strategy comprises the confection of three surveys. The surveys have the purpose to record the results of the natural experiment and to obtain complementary information. The third strategy uses econometric analysis to evaluate the robustness of the experimental results and to analyze other potential mechanisms driving the results.

3.1 Natural field experiment

Considering the literature reviewed in Chapter 2, the main strategy of the present research comprises a natural field experiment (NFE). The experiment assesses the influence of intuitive and rational thinking in the decisions to cooperate with a public good and to punish those individuals that fail to follow the norms of the society. For this purpose, the experiment exposes participants to two naturally occurring social dilemmas. This section clarifies the design and features of the NFE.

Recreating social dilemmas: decisions to cooperate and punish

The natural field experiment recreates a helping-norm to test the decisions to cooperate. The experiment recreates the helping-norm by asking an actor to "unnoticeably" drop one glove (as shown in Annex A: photos #1 & #2). In this way, the experiment is able to approximate the decisions to cooperate to a public good: All the community is better off if all of its members follow the norm of helping each other. Nevertheless, the time and effort to help gives incentives to deflect assistance and free ride on the cooperation of other members.

A one glove-drop is carefully chosen for four reasons.[15] First of all, it is well known to everybody the need to have the two gloves for a correct use, thus, dropping one glove is naturally perceived as a helping-norm. Second, the one glove-drop does not make any sound. This fact provides consistency and internal logic that the actor does not know that the glove has fallen. Third, gloves are big enough to be seen from the distance. This feature assures that participants of the experiment see the fall of the glove. Fourth, a glove does not comprise "high or low justifications" that could distort the decisions to

[15] In preliminary pilots, the experiment used items such as books, fruits and other pieces of cloth. However, only (gym) gloves adjusted well to the experimental dynamics and provided consistency of summer time.

cooperate (or deflect). On one side, using an object with "high justification" (i.e. jewelry, cellphone or a wallet) would "morally force" the individuals to help or steal them. On the other side, using an object with "low justification" (i.e. pencil or sheets) may be considered as not a significant object, discouraging participants to help. The NFE avoids these two situations using gloves.

Furthermore, the NFE proposes a violation of the non-littering norm to test the decisions to punish. Specifically, the experiment studies indirect punishment by asking the actor to litter before developing the helping-norm. In other words, the actor litters first (using an empty plastic bottle[16]) and then drops the glove. This condition is shown in Annex A: photo #3. More specifically, the research is able to assess indirect punishment by comparing the rates of cooperation in this social dilemma with the rates of cooperation of the initial helping-norm (pure-cooperation condition). Hence, it is possible to examine whether citizens tend to withhold help if an individual litters first, punishing the norm-violation for breaking the non-littering norm.

Personnel

Three personnel participate in the NFE: an actor, a participant and the researcher. The actor recreates the naturally occurring social dilemma (i.e. cooperation or indirect punishment). In the cooperation condition, the actor represents any given individual in the society that requires help. In the indirect punishment condition, the actor represents any norm-violator individual in society that requires help. Thus, actors allow the analysis and inference of the results at the societal-level. Lastly, the experiment selects an actor and an actress to analyze the potential influence of gender on the decisions to cooperate or punish.

Furthermore, the participant is a citizen chosen at random whose behavior is to be assessed in the NFE. Each participant has the decision to cooperate or to deflect. The following Section 3.1.4 ("Experimental Procedure") describes the characteristics that a participant needs to meet in order to be selected for the experiment. Finally, the researcher is in charge of the research team. The researcher has two main responsibilities: (1) to verify that all experiments follow similar procedures and, (2) to record the experimental results after each trial. The personnel is shown in Annex A: photos #2.

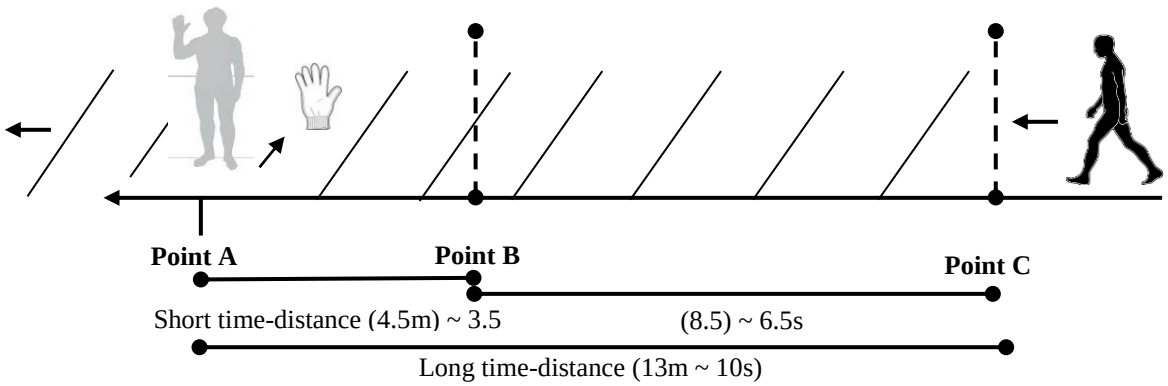
Location

The location of the experiment is carefully selected in the main sidewalk of Park Malieveld in The Hague (NL) because of five reasons. First, every individual walking in the sidewalk crosses the Park. By definition, each participant has to make a decision to cooperate (or deflect) if a helping-norm is developed along the way. Assuming that the participants see the experiment, they do not have the option to skip or avoid this decision (see Annex A:

[16] Balaoufas et al. (2014) uses a similar object.

photos #1 to #5). Second, this location eliminates reciprocity effects and social pressures (as explained in the following section "Experimental Procedure" 3.1.4), allowing participants to make private and anonymous decisions (see Annex A: photos #1 to #9). Third, as there is no reason to expect that the population walking on the Park would be different from an average resident of The Hague, this location minimizes selection biases. In particular, Park Malieveld is located in front of the main Central Train Station of The Hague and, it is surrounded by many learning institutes, university faculties, commercial businesses and non-governmental organizations. Fourth, this location increases the visual awareness, attention and focus of the participants as the main sidewalk is surrounded by trees and open grass fields (see Annex A: photos #6 to #9). Fifth, average human walking time can be used as a convenient parameter to encourage intuitive and rational thinking on the decisions to cooperate or punish (see Annex A: photos #1 to #3).

Figure 5
Treatments encouraging intuitive and rational thinking



Where,

Point A indicates the location where the actor creates the social dilemma.

Point B. From Point A, it is measured 4.5 m from the direction in which the participant comes to encourage intuitive decisions.

Point C. From Point A, it is measured 13 m in the direction in which the participant comes to encourage rational decisions.

Source: author's design.

The NFE uses average human walking time to encourage intuitive and rational decisions. As suggested in many Dutch and international studies, two time-distance thresholds calibrate an average human walking time in using 1.3 m/s (Boonstra et al. 1993; TranSafety, 1997; Levine et al. 1999; Browning et al. 2006; Mohler et al. 2007; Dongen & Heck et al. 2008). First, a "time-pressured" threshold is established 4.5 m away from the actor to encourage intuitive decisions. These decisions will be taken in around 3.5 s. Second, a "time-delayed" threshold is delimited 13 m away from the actor to encourage rational decisions. These decisions will be taken in around 10 s. Figure 5 displays the different designs used in the analysis.

The helping-norm is recreated at either of the two "time-distance" thresholds. First, the actor waits at Point A for a participant to get close to one of the two "time-distance" thresholds. Point B and Point C comprise a short and long "time-distance" thresholds. In other words, they represent the "time-pressured" and "time-delayed" decisions, respectively. Second, at either of these points, the actor recreates the helping-norm and faces the open fields of the Park. This eliminates social pressures and reciprocity effects on the decision of the participant. Annex A, Photos #1 & #2 show these treatments in the NFE.

The indirect punishment has a particular distinction. In this condition, the actor violates the non-littering norm before the participant reaches Point B or Point C, recreating the helping norm at the actual threshold (Point B or Point C). As an example, if the experiment is assessing the short time-distance treatment, the actor would litter before the participant reaches Point B and then, the actor drops the glove at Point B. This is shown in Annex A: Photo #3.

Experimental procedure

The experimental procedure provides consistency among all trials. Each of the experiments started with the actor sitting in a bench close to Point A. Meanwhile, the researcher was located in the opposite side of the preceding bench. This ensured no interference with the experiment, avoided social pressures on the participant and increased the observability of the researcher (see Annex A: photo #2).

Two bicycles were situated on the opposite site of the sidewalk to improve the visual consistency of the event. Bicycle #1 was located in front of the actor at Point A and Bicycle #2 marked the threshold of the treatment condition. Thus, the second bicycle stablished the "time-pressure" or "time-delay" condition (short-long, respectably). Moreover, the actor holds the glove/plastic bottle in a bag to recreate one of the two social dilemmas. This is shown in Annex A: photo #1 & #2.

Each trial began with the selection of a participant. There were three main features to categorize a participant as convenient. First, he/she needed to be alone and with no other subjects walking in the opposite direction or close to him/her. This eliminates social pressures. Second, the actor and the participant cannot be known to each other. This eliminates reciprocity pressures. Considering these two features, each participant developed private and anonymous decisions. Third, the participant had to be attentive and not visibly (walking) in rush. Annex A, Photos #4 & #5 evidence a typical participant of the experiment.

A cooperation treatment and a male actor are assumed to describe the rest of the experimental procedure. In the first step of the experiment, the actor leaves the bench and walks towards Bicycle #1, waiting for the participant to reach Point B or Point C (based on the treatment condition marked by Bicycle #2). In the second step, the actor recreates the helping-norm by "unnoticeably" dropping one glove when trying to put it in his bag. As he

continues walking, the actor reaches the end of the sidewalk facing Bicycle #1, pretending to look for the keys of the bike or to make a phone call (see Annex A: photos #1 to #3). In the third step, the actor waits until the participant reveals the decision to cooperate (or deflect) at Point A. Importantly enough, the actor does not respond to any voice alerts far from Point A. Instead, the actor awaits for an immediate physical contact or a voice alert behind him at Point A (see Annex A: photos #10 to #12). This ensures that each participant answers at the same threshold and he/she needs time and effort to help the actor. In the last step of the experiment, once the participant has made a decision at Point A, the researcher collects the results and the actor (follows and) interviews the participant, asking for additional individual characteristics (see Annex A: Photos #13 & #14).

Each participant had as much time to make a decision as his/her walking time allows, but restrained by the distance. While the short time-distance encourages intuitive thinking through faster decisions, the long time-distance encourages rational thinking through slower decisions. More importantly, as participants are randomly assigned to the treatments conditions, the study is able to assess the average differences in the rates of cooperation or punishment between these two conditions.

Experimental treatments

The natural field experiment can be summarized in three dimensions of two treatments each. The first dimension comprises the social dilemma, distinguishing among the cooperation and the indirect punishment conditions. The second dimension involves the dual-reasoning treatments, encouraging intuitive and rational decisions. The third and last dimension denotes the gender of the actors (male and female). Table 2 summarizes these categories.

Table 2
Dimensions and treatments of natural field experiment

Social dilemmas	Dual-reasoning	Gender
Cooperation *(helping-norm)*	Short time-distance *(Time pressured)*	Female, Male
Indirect punishment *(non-littering norm followed by helping-norm)*	Long time-distance *(Time delayed)*	

Source: author's design.

Testing the research questions

The NFE randomly assigns participants across treatments to answer the research questions. This fact prevents any systematical predisposition of their specific characteristics. Thus, by comparing the propensities to cooperate in both "time-distance" treatments, it is possible to answer whether the citizens

of The Hague are naturally predisposed towards altruism or selfishness and whether they shift their default behaviors with more thinking time.

Each social dilemma is analyzed independently. On one side, the analysis of the cooperation dilemma compares the propensities to cooperate in the "short treatment" with the "long" treatment. A positive difference indicates that the citizens of The Hague are predisposed towards altruism and cooperation, but behave more selfishly with more time to think. A negative difference suggests that they are selfish by nature, behaving more cooperative in time. On the other side, the analysis of the indirect punishment dilemma has to compare its propensities to cooperate with the (initial) rates in the short treatment of the cooperation dilemma. This approximates the mean propensity to withhold help as a consequence of the breaking the non-littering norm.

3.2 Surveys

Three additional surveys are applied to complement the results of the main strategy[17]. The first survey collects the results from each NFE. For this purpose, the experimental survey is divided into three sections (see Annex B: survey B1). The first section acknowledges the conditions of the experiment, distinguishing the treatments under analysis. The second section registers the decisions of the participants, discerning between "cooperates" and "deflects". Also, this second section assesses their helping behavior (i.e., "the participant touches the actor and points the glove"). The third section collects specific demographic characteristics of each participant such as age, gender, time lived in The Netherlands, willingness to undertake risks in daily life, height and other personal characteristics. Thus, this information is asked to each participant in a quick and informal interview after the NFE is over (see Annex A: photos #13 & #14).

Two other surveys are applied to ask other individuals what they would do if were hypothetically exposed to the NFE. Thus, these surveys assess different individuals from the participants of the NFE. As shown in Annex B: survey B2 & B3, one survey studies cooperation (B2) and the other examines indirect punishment (B3). Each survey is applied to 20 people, for a total of 40 data points. Additionally, both surveys included one experimental exercise, dividing two particular questions among 10 people per survey. While one version of the question inquired on the influence of time-pressured decisions (on 10 respondents out of the 20 per survey), the other version inquired on the influence of time-delayed decisions on the other half of the sample (the other 10 respondents per survey). Both surveys are collected in Park Malieveld.

3.3 Econometric specification

The econometric specification combines modeling features from previous empirical studies with the characteristics of the current NFE. Assuming dichotomous dependent variables (cooperates or deflects) and the randomized

[17] The three surveys are presented in Annex B.

nature of the data, it is suitable to adopt a linear probability model[18]. The model is specified in the present section.

The vector $C_{C,P}$ defines the dependent variable. For both cooperation and indirect punishment treatments, $C_{C,P}$ comprises a dichotomous variable with the participants' decision to cooperate ($c_i = 1$) or deflect ($c_i = 0$). In addition, a "Time-Distance" dummy ($TD_{L,S}$) and three demographic covariates (X_i) comprise the explanatory variables. The "Time-Distance" dummy comprises a dichotomous variable of the participants' exposure to the "long treatment" ($TD_L = 1$, representing rational decisions) and to the "short treatment" ($TD_S = 0$, representing intuitive decisions). Moreover, the (first) survey ex-post experiment captures the three demographic characteristics included in the specification of the model: age, gender and a dummy accounting for most life lived in The Netherlands (NL). Lastly, a vector ε_i is included to account for random disturbances. Therefore, the specification can be modelled as:

$$C_{C,P_i}(c_i = 1) = \beta_0 + \beta_1 TD_{(L=1,S)_i} + \begin{bmatrix} age \\ gender \\ NL \end{bmatrix}_i * \begin{bmatrix} \beta_2 \\ \beta_3 \\ \beta_4 \end{bmatrix} + \varepsilon_i$$

Where,
$C_{C,P}$ = 1, if subject chooses to cooperate, 0 if subject deflects.
$D_{S,L}$ = 1, if subject is exposed to the long treatment, 0 if exposed to the short treatment.
X_i , includes covariates of age, gender and most time lived in The Netherlands.
ε_i, disturbance term.

The magnitude, sign and statistical significance of the "Time-distance" coefficient provides the main results of this strategy. First, the magnitude indicates the size of the influence of rational decisions (TD_1) on the average propensities to cooperate. Second, the sign indicates the direction of the influence. A positive sign would imply a natural human inclination to act selfishly, increasing cooperation with more rational decisions. Meanwhile, a negative sign would imply a natural human inclination towards cooperation, increasing selfish behavior with more rational decisions. Third, the "Time-distance" coefficient will be statistically significant if it has a p-value below 10%, implying a causal effect of the variable on the decisions to cooperate of the population under analysis.

The interpretation of the "Time-distance" coefficient shifts between social dilemmas. The interpretation is straightforward in the cooperation treatment, interpreting the coefficient as the effect of rational thinking on the propensity to cooperate. However, the interpretation shifts in the indirect punishment treatment, as the coefficient only analyzes the difference in the rates of cooperation between "short" and "long" treatments. In this case, the

[18] Rand et al. (2012), Balaoufas (2012), Rand et al. (2014) and Balaoufas et al. (2014) used this approach.

interpretation needs to include the initial (indirect) penalty shown by the difference between the constants of both social dilemmas.

Furthermore, the econometric analysis includes two robustness tests to check the consistency of the estimations. The first test contrasts the measure of willingness to undertake daily-risks and height levels of the participants with their propensities to cooperate. Thus, this test evaluates potential effects of risk attitudes and height levels on the decision to cooperate and punish. The second test[19] interacts a risk-dummy variable divided by its sample average (risk-attitude above mean=1, risk-attitude below mean=0) and contrasts it to the "time-distance" condition. By doing this, the test verifies any displacing effects of risk-taking and risk-averse individuals on their decisions to cooperate and punish.

4 Data

This chapter describes the data gathered in three sections. The first section outlines the characteristics of the data collection process. The second section summarizes the number of observations per treatment. The third section displays the demographic statistics of the participants in the sample. Furthermore, this chapter supports the main findings presented in chapter 5.

4.1 Data collection

The research team collected the data during the summer of 2015. Specifically, the NFE was performed three times a week for around 3 to 5 hours per day. This strategy avoids both the repetition of participants and that all the potential participants become aware of the research. Moreover, the treatments were randomly assigned independently of day, hour and climate. Table 3 displays the main features of the data collection.

Table 3
Characteristics of data collection

Criteria	Description
Data	267 experimental trials & 40 surveys.
Period	July 6th to August 7th, 2015
Location	Park Malieveld, The Hague (NL).
Actors	(2) Female and male.
Days and hours	Week days between 10am and 5pm; 2 or 3 days per week.
Climate	All conditions, except raining or very low temperature.

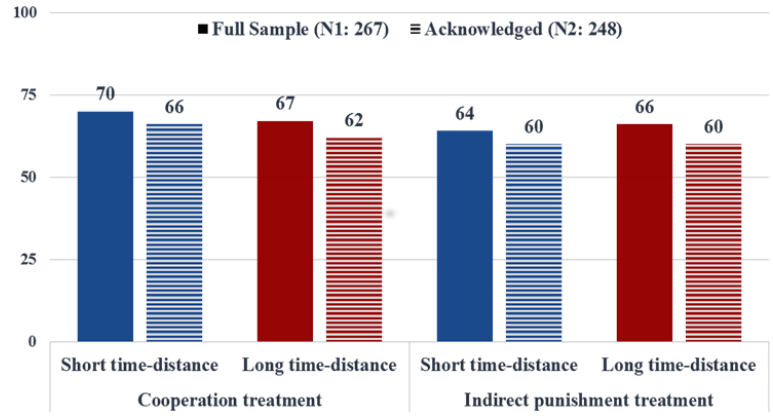
Source: data gathered by author.

[19] A third placebo checks for similar interactions of height levels. However, such test is not further discussed as its interpretability is not fully clear on the results of this experiment.

4.2 Data sample

The complete sample comprises 267 participants. Of this full set, 8.2% rejected visual contact with the experiment[20] (or were not able to answer the survey to confirm it[21], n1: 19). To recognize the importance of observing the experiment, the data is divided in two samples sets. The "Full sample" comprises the complete set (N1: 267). The "Acknowledged sample" includes only those participants that did not reject to see the experiment (N2: 248). Figure 6 displays the number of observations per treatment[22].

Figure 6
Number of observations per sample type



Notes: Blue represents the treatment encouraging "intuitive decisions".
Red represents the treatment encouraging "rational decisions".

4.3 Demographic statistics

The demographic statistics of the participants indicate that the experiment comprise a representative sample of the citizens of The Hague[23]. They display a mean age of 44 years with 68% ranging between 30 and 58 years old. The sample presents considerable gender balance although is slightly leaning to males (61%). In terms of height, participants have an average height of 175 cm whereas only 5% range below 155 cm or above 195 cm. Around 68% have a general risk-taking attitude between 3.9 and 7.6 points. Also, as expected from such an international environment as The Hague, participants have a high

[20] Participants could reject visual contact to avoid feelings of shame and guilt (social pressures) even if they did see the experiment.
[21] Were not willing to answer or did not speak English, Spanish or Greek. Also, 3% was not willing to be surveyed despite deciding to cooperate (n2: 8).
[22] Assuming β: 80% and α: 5% and big sample conditions (n≥30) per treatment, the data sample satisfies the specification for significant differences in proportions.
[23] Importantly, the survey ex-post experiment ask this information to each participant.

spread in the years lived in The Netherlands. Finally, these statistics remain systematically balanced across treatments. Table 4 displays the demographics statistics of the Full Sample.

Table 4
Demographic statistics of full sample

Variable	Obs.	Mean	P-value Δ	Std. Dev.	Min.	Max.
Age	234	43.77	0.564	13.969	15	76
Male (=1, Female=0)	267	61%	0.294	0.488		
Most years lived in The Netherlands (=1, Other=0)	236	82%	0.866	0.386		
Height	230	175.32	0.456	10.769	147	204
Years lived in The Netherlands	234	37.74	0.704	20.381	0.008	76
Willingness to undertake risk	233	5.744	0.442	1.85	0	10

5 Results

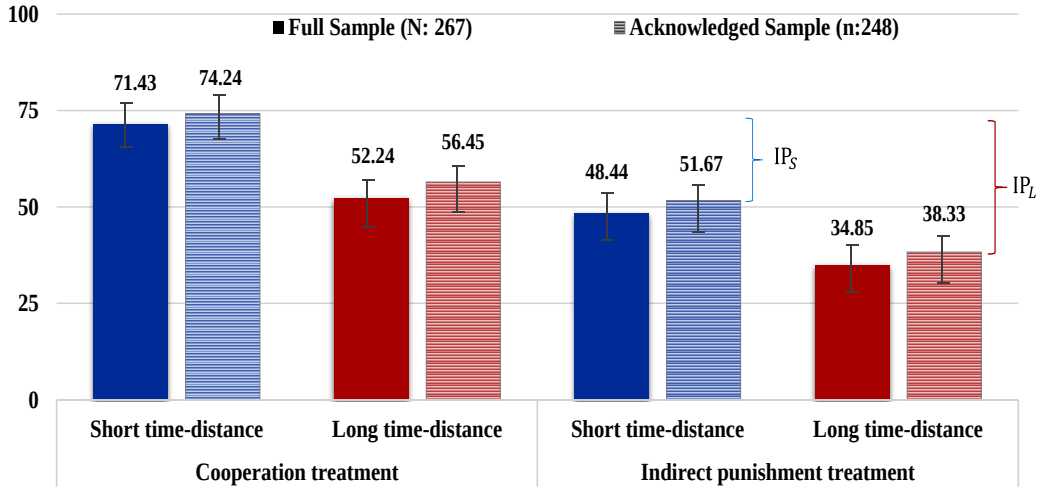
This chapter presents the results of the study. For this purpose, the chapter is divided in four sections. The first section presents the main findings, separating between unconditional results and conditional on the gender of the actor. The second section analyzes the results of the two surveys that hypothetically exposed (other) subjects to the NFE. The third section examines the robustness of the main results.

5.1 Main findings

Unconditional results

The unconditional results provide strong evidence that the citizens of The Hague are naturally inclined to cooperate, behaving more selfishly as time to think increases. In the cooperation treatment, participants show a propensity to cooperate close to 71 pp in the short condition, reducing the propensity to around 51 pp in the long condition. In other words, participants show a natural and innate predisposition towards altruism, helping strangers in a spontaneous and instinctive manner. However, when participants had more time to think, they outweighed their personal cost of helping versus their moral obligations of preserving the helping-norm. Hence, the difference of 20 pp in favor of the short treatment provides clear evidence that participants become more selfish in time. Figure 7 displays the main results for both the Full sample and the Acknowledged sample.

Figure 7
Unconditional propensities to cooperate per treatment



Notes: Blue represents the propensities to cooperate in "intuitive decisions".
Red represents the propensities to cooperate in "rational decisions".
$IP_{S,L}$ implies the propensities to punish indirectly in short and long treatments, respectably.

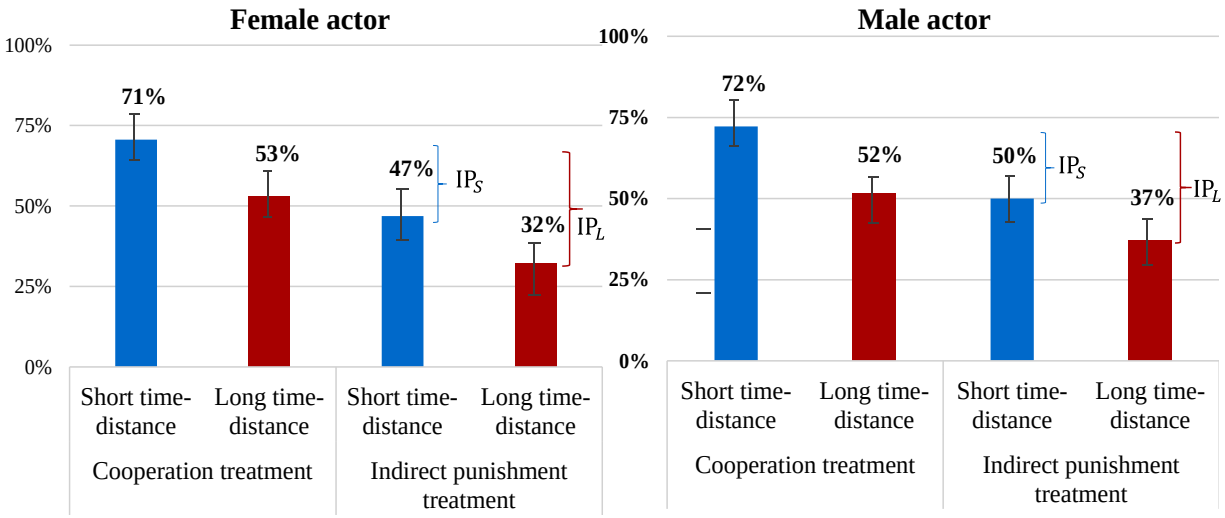
In the indirect punishment treatment, the results indicate that the citizens of The Hague have a natural inclination to punish norm-violators, increasing the penalty in time. This fact can be observed by comparing the rates of cooperation in the punishment dilemma to the (initial) rates in the short condition of the cooperation dilemma. In Figure 7, "$IP_{S,L}$" indicates the net effect of the indirect punishment under intuitive and rational decisions. In particular, participants demonstrated an instinctive punishment close to 20 pp, increasing the refusal to help to around 35 pp as time to think increases.

Conditional on gender of actor

The main findings remain consistent independently of the gender of the individual that develops the social dilemma. In particular, the propensities to cooperate remain around 72 pp for both the actor and the actress, decreasing the likelihood to around 52 pp when participants engage in more rational thinking. Hence, the evidence supports that independently of the gender of the individual in help, the citizens of The Hague are naturally predisposed to cooperate, but they behave more selfishly in time. Figure 8 displays the results for the Full sample[24].

[24] The Full Sample is chosen for clarity of the graph. As shown in Figure 7, the values do not vary much between Full and Acknowledged Samples.

Figure 8
Propensities to cooperate conditional on gender of actor



Notes: Blue represents the propensities to cooperate in "intuitive decisions".
Red represents the propensities to cooperate in "rational decisions". IP_(S,L) implies the propensities to punish indirectly in short and long treatments, respectably.

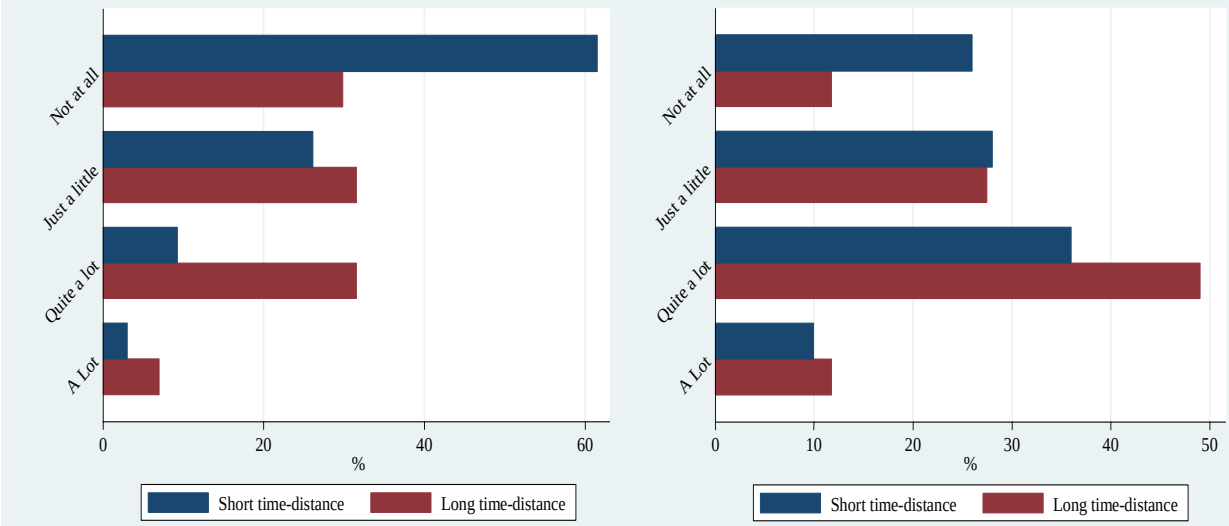
The evidence also suggests that the citizens of The Hague are innately predisposed to withhold help to both genders of norm-violators. In addition, the citizens increase the penalty when engaging in more rational thinking. For both the actor and the actress, the results indicate that participants are predisposed to punish indirectly by about 20 pp, increasing the penalty close to 35 pp when they had more time to think.

Effectiveness of treatments

The application of the social dilemmas and the dual-reasoning treatments are successful and effective to meet the proposed goals. Regarding the social dilemmas, the participants clearly enforced the norm of helping strangers of the community, as the experimental results observe high rates of cooperation. Moreover, and as expected from the work of Balaoufas et al. (2014), participants reduced the propensity to help as an indirect punishment to norm-violators[25]. As mentioned in the previous section, the propensity to cooperate decreases between 20 pp and 35 pp when the actor/actress littered first.

[25] Many participants directly expressed their unwillingness to help because of the initial violation of the non-littering norm. They stated expressions such as: "Yes, I refused to help just because you littered first. We do not do that in this country".

Figure 9
Participants' revealed difficulty of decision per treatments



The survey ex-post experiment also supports an effective encouragement of "intuitive and rational thinking". One particular question of this survey inquired each participant about the level of difficulty of his/her decision (see Annex B: section B1, question C10.). As observed in Figure 9, participants made easier decisions in the treatments that encouraged "intuitive thinking"[26] and experienced an average higher difficulty in the treatment that encouraged "rational thinking". For instance, the option "Not at all" comprises more than 60% of the participants in the shorter version, but is reduced to around 25% in the longer version. Meanwhile, the relationship strengthens when comparing between social dilemmas. Participants exposed to the indirect punishment dilemma expressed a higher mean difficulty than those exposed to the cooperation dilemma. For instance, the option "Quite a lot" becomes the preferred alternative in the punitive dilemma, ranging between 35% in the short version to almost 50% in the long version.

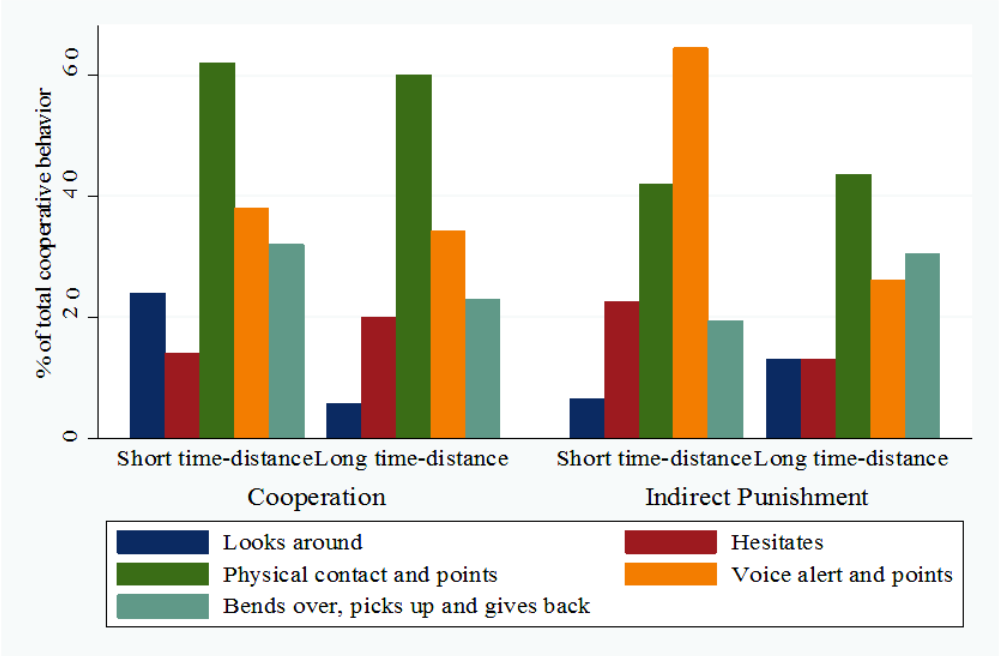
Helping behaviors

The ways in which participants helped provide additional information on the processes of decision making and social behavior. The study examines five specific helping-behaviors. First, attitudes of "hesitation" and "looking around" are analyzed prior to decision making. Second, the study distinguished two particular ways of helping the actors: "physical contact and pointing glove" or, "bending over, picking glove and giving it back". These helping-

[26] Many participants explained their decisions as instinctive, unexpected and innate behaviors. For instance, some expressed phrases such as: "It was an instinctive reaction", "Actually, I did not have time to think, I just did it" and "It was a simple decision to me".

behaviors are shown in Annex A, Photos #10 & #11. Finally, the "voice alert and pointing glove" action is analyzed as an ex-ante behavior and as a way to help the actor. Figure 10 displays the results across treatments.

Figure 10
Helping-behaviors per treatments



The cooperation dilemma displays relatively stable helping behaviors across dual-reasoning treatments. In terms of the short and long conditions, the most repeated helping behavior is "touching actor and pointing glove" (more than 60%) and the most costly helping attitude is "bending over, picking up and giving back" (performed in at least 20% of the cases). Interestingly enough, the propensity to undertake the latter decreases about 8p.p in the long treatment, supporting an increase in selfishness as "rational thinking" takes over.

Conversely, the indirect punishment dilemma displays curious variations in the helping behavior. The results suggests that in average, the citizens of The Hague pay a lower personal cost when helping a norm-violator. For instance, while "physical contact and pointing" decreases about 20p.p when compared to the cooperation dilemma, "voice alert and pointing" duplicates to comprise about 60% of them. Interestingly, "bending over, picking up and giving back" was relatively stable across all treatments. This fact suggests that around 25% of the citizens of The Hague have an innate urgency to help strangers by paying the full personal cost (and despite a norm-violation).

5.2 Surveys

The present section analyses the results of the surveys that hypothetically exposed respondents[27] to the NFE. Initially, they were asked about their motivation to cooperate in both social dilemmas (see first two questions in Annex B, sections B2 & B3). The results of the cooperation survey suggest a slight positive association of shorter time-distances with higher help. For instance, while 100% of respondents chose "Yes, I am sure" and "Most probably yes" in the shorter version; their motivations decline in the long version to include 20% in "Most probably not"[28]. In practice, the respondents associated the decisions of the shorter treatment with more physical reactions and the longer ones with more carefully analyzed behaviors. The participants also recognized that the costs of helping, their moral obligations and the physical characteristics of the individual could play a crucial role in the decision to cooperate or not. Figure 11 displays these results.

The results of the indirect punishment survey suggest that respondents reduce the motivation to help norm-violators. For instance, while the short version gathers 30% of responses in the two negative options, more than half of the respondents acknowledges a partial or complete unwillingness to help in the long treatment (60%).

Furthermore, respondents are asked whether quicker or delayed decisions could influence their answers (see third question in Annex sections B2 & B3). The results show a slight indication that quicker decisions are positively associated with higher rates of cooperation. However, the evidence is not conclusive enough. For instance, while the cooperation dilemma displays a difference of 30 pp in the two positive motivations ("Most probably yes" and "Yes, I am sure"), the negative alternatives do not have any real differences (20% each). Likewise, respondents do not display clear patterns in the case of indirect punishment. Figure 12 displays these results.

[27] The respondents of these surveys should not be any different from the average citizen of The Hague: average age (37.5 years), time lived in NL (25.7 years), days going to Park Malieveld (less than twice a week) and gender (males: 58%).

[28] Notice that no respondent expressed a complete unwillingness to help (i.e. "No, I would not"). This demonstrates how social pressures influence responses in artificial instruments when comparing with the rates of deflection from the real natural experiment (section 5.1).

Figure 11
Survey: motivation to help per treatments

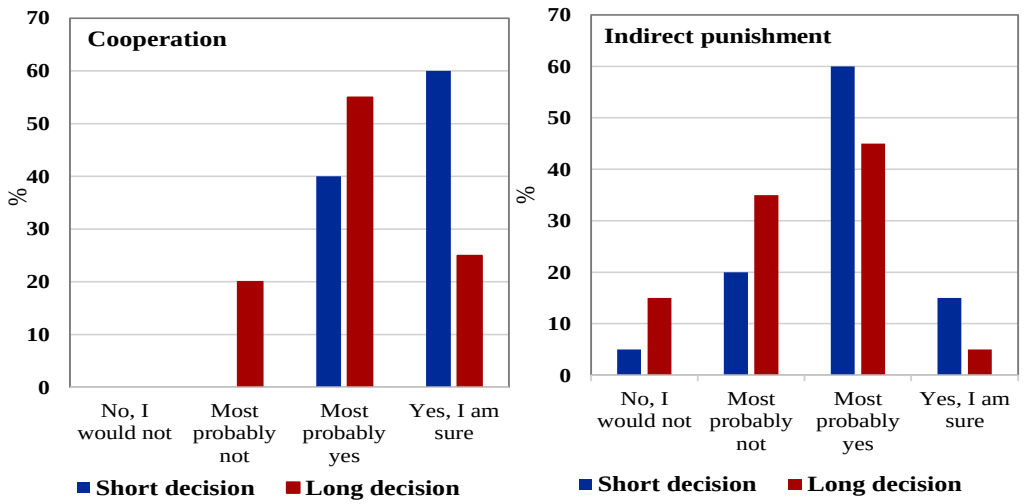
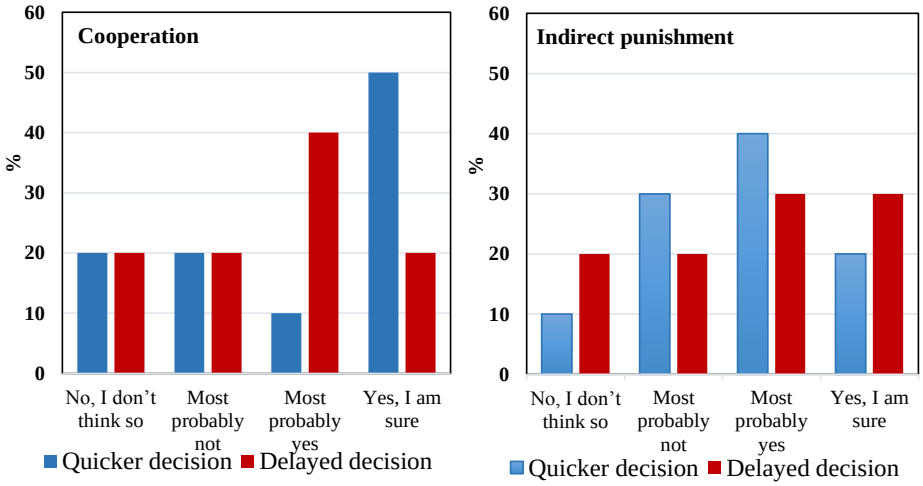


Figure 12
Surveys: influence of time on cooperation per treatments



Despite the tendency suggested by the results, the surveys do not provide convincing and clear evidence to answer the research questions of this study. In particular, the results indicate very high motivations to cooperate that do not match with the actual helping rates obtained in the natural field experiment. This fact illustrates why the questions of the current research cannot be assessed using artificial instruments such as surveys, as the latter do not avoid social pressures. Instead, it is a more reliable and suitable strategy to analyze the results of the natural field experiment. As a consequence, the following section checks the robustness of the initial results of the NFE.

5.3 Robustness and mechanisms

This section examines the sensitivity of the main results with regard to the observable characteristics of the participants. Given the randomized treatment status, point estimates should be stable across models. Standard errors or the precision of estimates may be improved by decreasing residual variance. In addition, this section examines heterogeneous treatment effects through the interaction of the treatment status with observable characteristics. For instance, are riskier people more or less inclined to cooperate and punish under time pressure?

Cooperation treatment

The econometric analysis confirms that the citizens of The Hague are intuitively predisposed to help, but behave more selfishly when they have more time to think. Participants demonstrate an innate propensity to cooperate of about 72 pp in both samples. However, the propensities decrease by around 18 pp when participants have more time to think, becoming about ½ and ¼ of the decisions. Importantly, the causal effect remains stable after including observable characteristics. Table 5 displays the results.

Table 5
Cooperation estimates

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Time-distance (long=1, short=0)	-0.192*	-0.183*	-0.207*	-0.178*	-0.169*	-0.194*
	(0.082)	(0.085)	(0.083)	(0.083)	(0.086)	(0.084)
Age			0.005			0.005
			(0.003)			(0.003)
Male (=1, female=0)			0.089			0.096
			(0.090)			(0.090)
Country most lived in (The Netherlands=1, other=0)			0.105			0.110
			(0.116)			(0.116)
Constant	0.714**	0.742**	0.391*	0.742**	0.738**	0.398*
	(0.054)	(0.054)	(0.162)	(0.054)	(0.055)	(0.163)
N	137	125	125	128	123	123
Sample		Full			Acknowledged	
Demographic covariates			X			X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

Two robustness checks confirm the consistency of the results. The simpler placebo test suggests no significant spillovers of risk attitudes and height levels on the decisions of the participants (neither independently nor jointly). The "time-distance" coefficient remains close to ½ of the mean propensity. The stronger placebo test finds spillovers of risk attitudes over the

sample. However, the combined effects of the interaction term and the "time-distance" coefficient preserve the negative and casual effect of the latter variable. Annex C displays these results in Tables 9 and 10 respectively.

The results remain consistent per gender of the actor. On one side, a stranger that has more time to think would avoid cooperating with a female individual by roughly 20 pp. Nonetheless, the age of the stranger would increase the likelihood to cooperate by 12pp for every 10 years older (around 50% of the mean propensity). On the other side, having more time to think reduces the likelihood of a stranger to help a male individual by 21 pp. Conversely, if a stranger has lived most of his/her life in The Netherlands, the likelihood to cooperate increases by 46 pp (i.e., about 90% of the mean propensity). Thus, the results suggest that experience with the norms of the Dutch society also play a role in the decisions to cooperate. These estimates are displayed in Table 6.

Table 6
Cooperation estimates per gender of actor

Variables	Female				Male			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time-distance (long=1, short=0)	-0.176 (0.12)	-0.224* (0.11)	-0.147 (0.12)	-0.208+ (0.11)	-0.207+ (0.12)	-0.192 (0.11)	-0.209+ (0.12)	-0.185 (0.12)
Age		0.013** (0.00)		0.012** (0.00)		-0.003 (0.00)		-0.004 (0.00)
Male (= 1, female=0)		0.131 (0.12)		0.144 (0.12)		0.04 (0.13)		0.037 (0.13)
Country most lived in (The Netherlands=1, Other=0)		-0.172 (0.16)		-0.165 (0.16)		0.459**(0.16)		0.460** (0.16)
Constant	0.706 (0.08)	0.248 (0.2)	0.727** (0.08)	0.261 (0.22)	0.722** (0.08)	0.501* (0.22)	0.758** (0.08)	0.512* (0.22)
N	68	64	64	63	69	61	64	60
Sample	Full		Acknowledged		Full		Acknowledged	
Demographic cov.				X				X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

Indirect punishment treatment

The econometric analysis also confirms that the citizens of The Hague are predisposed to punish norm-violators, increasing the penalty in time. The mean propensity to cooperate decrease from 71 pp in cooperation dilemma to around 50 pp in the indirect punishment dilemma. This difference implies an innate penalty of around 20 pp. More importantly, the results suggest that more time to think has a positive causal effect on the decisions to punish. For instance, participants exposed to the "long" version withhold help by an

additional 16 pp (between ½ and ¼ of the mean decisions), suggesting a total penalty close to 35 pp when citizens have more time to think. These results are shown in Table 7 (in the following page).

Two robustness tests check the reliability of these estimations. A simpler test finds no independent or joint spill-overs of risk attitude or height levels on the decisions to cooperate. Likewise, the stronger test does not find any statistically significant influence of risk-attitudes above and below the sample mean driving the estimations. Nonetheless, the "time-distance" coefficient losses statistical significance. Tables 12 and 13 in Annex C display the results of these tests.

Table 7
Indirect punishment estimates

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Time-distance (long=1, short=0)	-0.136	-0.170+	-0.175+	-0.133	-0.163+	-0.172+
	(0.086)	(0.095)	(0.095)	(0.091)	(0.096)	(0.096)
Age			0.001			0.001
			(0.003)			(0.003)
Male (=1, female=0)			-0.176+			-0.171+
			(0.099)			(0.100)
Country most lived in (The Netherlands=1, other=0)			0.063			0.050
			(0.133)			(0.137)
Constant	0.484**	0.538**	0.557**	0.517**	0.538**	0.570**
	(0.063)	(0.070)	(0.191)	(0.065)	(0.070)	(0.194)
N	130	109	109	120	108	108
Sample		Full			Acknowledged	
Demographic cov.			X			X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

Furthermore, the results suggest a slight variation per gender of the actor. On one side, a stranger exposed to the long treatment would decrease help by around 17 pp if dealing with a female norm-violator. On the other side, a stranger would decrease help by about 10 pp if a male norm-violator is involved in the situation. Nonetheless, these coefficients lose statistical significance. More interestingly, the study finds a strong and positive causal effect of male strangers punishing other male norm-violators by an extra 26 pp. Table 8 displays these estimations.

Table 8
Indirect punishment estimates per actor gender

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time-distance (long=1, short=0)	-0.146 (0.12)	-0.188 (0.14)	-0.167 (0.13)	-0.188 (0.14)	-0.129 (0.12)	-0.068 (0.15)	-0.1 (0.13)	-0.062 (0.15)
Age		0.004 (0.00)		-0.004 (0.00)		0.009 (0.01)		0.009 (0.01)
Male (= 1, female=0)		-0.107) (0.14)		-0.107 (0.14)		-0.267+ (0.14)		-0.256+ (0.14)
Country most lived in (The Netherlands=1, other=0)		0.129 (0.18)		0.129 (0.18)		-0.032 (0.19)		-0.061 (0.2)
Constant	0.469** (0.09)	0.640* (0.28)	0.500** (0.09)	0.640* (0.28)	0.500** (0.09)	0.348 (0.3)	0.533** (0.09)	0.369 (0.3)
N	63	54	60	54	67	55	60	54
Sample	Full		Acknowledged		Full		Acknowledged	
Gender	Female				Male			

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

6 Discussion of results

The present chapter discusses the results of the study in four sections. The first section compares the current findings with previous studies. The second section explores several implications associated with the present results. The third and fourth sections outline opportunities for improvement and avenues for future research, respectably.

6.1 Comparison of results with previous studies

Analogous to Rand et al. (2012), Rand et al. (2014) and Neilsen et al. (2014), the present results find causal effect of thinking time on human cooperation. Similar to these studies, the present results propose that humans are naturally predisposed to cooperate with strangers. However, humans switch their default decisions, becoming more selfish as thinking time increases. Moreover, similar to Rand et al. (2014), this current results suggest that experience with the social norms of the society play an important role in the decisions to cooperate in modern societies. On the contrary, the current findings oppose those found by Tinghög et al. (2013) and Verkoeijen & Bouwmeester (2014). Finally, the results eliminate human confusion and mistakes described by Recalde et al. (2014); and subsequently in Recalde et al. (2015).

In the same vein, the present study finds akin propensities to cooperate as Rand et al. (2012), but higher than those found by Balaoufas et al. (2014). While Rand et al. (2012) finds that intuitive contributions comprise about 67%

(of the total amount), falling to 53% with rational decisions; the current study finds similar rates of cooperation of around 72% and 52%, respectively. Conversely, these rates of cooperation are far higher than the 40% published by Balaoufas et al. (2014).

In terms of the punishment dilemma, the current study has some comparable results to previous literature. For instance, Balaoufas et al. (2014) finds a 20% of indirect punishment which is similar to the lower boundary of the present results (i.e. between 20% and 35% in Figure 7). Likewise, Balaoufas et al. (2014) finds that this punitive behavior is mostly executed on male violators (27%). This features matches the present findings, suggesting that males withhold help to other male violators by 26 pp.

6.2 Implications

The findings of this work have four key implications. First and foremost, the data provides information to Dutch government agencies about the natural interaction between citizens of The Hague, the way they behave and how they cooperate with each other. Thus, government agencies and non-governmental institutions could design campaigns to improve the trust and helpfulness between citizens and to motivate (new) citizens to understand better the norms of the Dutch society. This is important as the results clearly show that violations of social norms, in this case littering, are likely to be heavily punished. For instance, this is important as individuals (such as immigrants) that do not follow social norms could engender resentment, damaging social efficiency and economic advancement in the long run.

Second, these findings could reveal more insights with future studies. Additional work carried out in societies with different characteristics to those found in The Hague could provide deeper comparative perspectives on the nature of human cooperation in modern societies.

The third implication becomes relevant in the way humans negotiate free trade agreements, donations and international aid contracts. The present findings motivate the development of strategies limiting beneficial options and to pressure the partner country to make a fast decision. In this way, the partner country would be encouraged to select one of these beneficial options, promoting better outcomes for the interested party. For instance, lawyers and police officers use the following technique: they pressure witnesses and criminals to agree with their propositions or to reveal true facts. Moreover, the results suggest that a country could access international aid more easily from countries that shared the same norms. Similarly, this implies that matching the social norms to the potential donor could improve the access to their international aid. Conversely, indirect punishment could become relevant when countries do not follow contract norms. In such cases, the affected partner countries might refuse future aid/support/cooperation as (a result of an) indirect punishment for breaking the norms of a previous agreement.

The fourth implication could come from research in other fields. As the present study outlines distance as a further variable driving social behavior, the

results of this research could be used in future developments of urban planning, civil engineering, emergency and security strategies or charity fundraising schemes. Potential improvements in these areas could advance socioeconomic efficiency and economic development in the short and long runs.

6.3 Opportunities for improvement

The study identifies three potential opportunities for improvement. The first opportunity takes into account that participants have difference capabilities to process information. Thus, participants could process stimuli faster or slower independently of the exposure to a particular dual-reasoning treatment (Rubinstein, 2007). Although this concern is eliminated by randomly assigning participants to the treatments conditions, future research could evaluate their heterogeneous cognitive speeds. The second opportunity comprises the quickness and/or complexity in the execution of the social dilemmas. Future research could explore the effects of different experimental procedures on the stability of the findings. The third opportunity recognizes how the assertiveness and attention of the visual system, the valued importance of the event and the speed of the event may shape human behavior (Fehr & Rangel, 2011). Future research could advance the exploration of these considerations.

6.4 Avenues for future research

This study distinguishes three avenues for future research. The first avenue could investigate regional, intergenerational and individual differences. Thus, future research could assess the propensities to cooperate and punish between urban and rural areas, younger and older people, and among people with different physical characteristics. The second path could assess how other social norms could vary the present findings. The third avenue for future research may study the areas of activation of the human brain when indirect punishment is exercised. This could expand the understanding of the processes of decision making of this particular social behavior.

7 Conclusions

This research paper studied the nature of human cooperation. The study examined whether humans are predisposed to selfishness or altruism, and, whether people switch their default behavior when there is more time to think. This research paper expands the latter questions to analyze punitive behavior and the effects of the gender of the individual. To investigate these issues, the study relied on a natural field experiment exogenously varying average human walking time.

The present findings suggest a causal effect of thinking time on human behavior. While the citizens of The Hague are innately predisposed to be altruistic with strangers, they shift their default response to behave more

selfishly when they have more time to respond. Furthermore, the citizens of The Hague naturally withhold help to those that fail to follow social norms and the disinclination to help increases with response time. Moreover, the current findings are comparable with the published literature in the field and econometric analysis confirm the consistency of the results.

The present findings are important in many areas of current debate to governments around the World. Governments may design campaigns to motivate immigrants and local citizens to understand the norms of their new societies. The results imply that in order to create a more integrated society needs to be a greater understanding and appreciation of the social norms of the country. By doing this, the society would increase in trust and efficiency. However, falling to do this may lead to punitive behavior affecting the social cohesion and economic socio-economic efficiency. In particular, these results could indicate actions to be taken by the government of The Netherland in regard to the current Syrian immigration as well as other governments experiencing strong legal and illegal immigration (such as Costa Rica with immigrants from Nicaragua or the United States with Mexicans).

The results could also have important implications in international negotiations and access to international aid. The results suggest that cooperation between countries may be strengthened if they follow the same social norms. Thus, a country attempting to access international aid may find it easier to access aid if it shares the same norms as potential donors. In addition, the present results suggest that better negotiation techniques would limit options (all beneficial) and pressure the donor partner to decide one of them quickly. This would encourage the adoption of one of the beneficial options, promoting better outcomes. Moreover, countries should recognize that breaking the (contract) norms of the donor partner may encourage indirect repercussions (such as withholding future aid and cooperation) from the affected country as a penalty of breaking the norms of the previous agreement. Thus, the present results can improve future negotiating strategies enhancing the outcomes of the country in interest.

Last but not least, future research could expand the understanding in different other issues. Future focus on regional and individual differences. Future studies could assess the decisions to cooperate and punish between urban and rural areas and between contrasting societies. Similarly, future experiments could assess how physical characteristics and the heterogeneity in the cognitive speeds of participants could change the current findings. Finally, future studies on different societies could provide more insights on the way human cooperation evolve in the process of modernization across societies.

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Appendices

A. Photos of Natural Field Experiment

Photo 1
Cooperation in the short time-distance treatment

Note: The actress recreates the cooperation treatment and the short time-distance treatment on a female participant.

Photo 2
Cooperation in the long time-distance treatment

Note: The actress recreates the cooperation treatment and the long time-distance treatment on a male participant.

Photo 3
Indirect punishment with long time-distance treatment

Note: The actor recreates the indirect punishment dilemma and the long time-distance treatment on a female participant. Notice the empty plastic bottle and the glove in the scene.

Photo 4
Characteristics of location and position of researcher

Note: The location and the position of the researcher encourages private and anonymous decisions. First, the location promotes that participants make decisions when they are alone (no other individual comes in the opposite direction or is near them). Second, the researcher locates in the opposite side of the preceding bench. In this picture, the researcher waits for a participant coming from the opposite side of the sidewalk.

Photo 5
Characteristics of participants

Note: A participant must meet four characteristics:
(1) alone and attentive,
(2) he/she is unknown to the actor and researcher,
(3) there is no other
subject coming in the opposite direction of the sidewalk and,
(4) the participants is not visibly in a rush.

Photo 6
Location, front view

Photo 7
Location, left view

Photo 8
Location, right view

Photo 1
Location, back view

Photo 10
Example of helping-behavior: participant bends over, picks the glove up and gives it back to actor

Note: The participant decides to help the actor. In this case, the participant bends over, picks the glove up and gives it back to the actor at Point A.

Photo 2
Example of helping-behavior: voice alert and pointing

Note: The participant decides to help the actor. In this case, the participant gives a voice alert and points to the actor at Point A.

Photo 3
Indirect punishment with short time-distance treatment and helping-behavior: participant deflects

Photo 4
The actor surveys the participant after the experiment

Note: The actress follows the participant after the experiment is over. Then, the actress interviews the participant using the survey ex-post experiment. This survey obtains additional individual characteristics of the participant.

Photo 14
Close-up of the actor surveying the participant after the experiment

B. Surveys

B.1 Experimental template and post-experimental survey

Section A. Experiment.

A1. Time dimension,
1. Time pressure.
2. Time delay.

A2. Social-dilemma,
1. Cooperation.
2. Punishment.

A3. Gender dimension,
1. Female.
2. Male.

A4. Day time,
1. Morning.
2. Afternoon.

Section B. Results.

B1. Behavioral response,
1. Cooperates.
2. Punishes (directly).
3. Deflects.

B2. Qualitative behavior,
1. Looks around.
2. Hesitates.
3. Touches actor and points object.
4. Bends over, picks and gives back.
5. Yells and points to alert.

Section C. Post-experimental survey for participants' data

After each participant crossed Point A, the actor/actress followed the participant and asked: "Excuse me, I am a researcher of Erasmus University and I just (littered and) dropped my glove as an experiment. Could I ask you a few quick questions? We can walk together if you want".

C1. Did you see the (littering) and the drop of the glove ? 0. Yes _____. 1. No _____.

C2. How willing are you to take risks in general? From 0 to 10 where max. is 10: _____.

C3. What is your height in cm? _____ cm.

C4. What is your age? _____ years.

C5. How long have you lived in The Netherlands? _____ (in years / months).

C6. How difficult was to make the decision of what to do? 0. Not at all _____. 1. Just a little _____. 2. Quite _____. 3. A lot _____.

C7. Comments _____ .

B.2 Cooperation survey-based interview

CS1. Consider the following situation: you are in this park walking towards a stranger. Suddenly, when you are close (about 4.5mts) the stranger drops one glove not noticing it. Do you think you would help the stranger?

1. No, I would not.
2. Most probably not.
3. Most probably yes.
4. Yes, I am sure.

CS2. Consider a similar situation, but now you realize the glove drop at a longer distance (about 15mts). Do you think you would help the stranger?

1. No, I would not.
2. Most probably not.
3. Most probably yes.
4. Yes, I am sure.

C3 is divided in two alternatives to each half of the sample. CS3a. In particular, do you think a quicker decision encourages you to help? CS3b. In particular, do you think a more delayed decision would encourage you to help?

1. No, I do not think so.
2. Most probably not.
3. Most probably yes.
4. Yes, I think so.

CS4. How long have you lived in The Netherlands? _____(in years / months).

CS5. How helpful do you consider the society of The Netherlands?

1. Not helpful at all.
2. Just a little helpful.
3. Quite helpful.
4. Highly helpful.

CS6. How often do you come to Park Malieveld?

1. Less than once a week.
2. Once / Twice a week.
3. Three to five times a week.
4. More than five times a week.

CS7. Age. _____ years.

CS8. Gender,

1. Female.
2. Male.

B.3 Indirect punishment survey-based interview

P1. Consider the following situation: you are in this park walking towards a stranger. Suddenly, when you are close (about 4.5mts) the stranger litters and then drops one glove not noticing it. Do you think you would help the stranger?

1. No, I would not.
2. Most probably not.
3. Most probably yes.
4. Yes, I am sure.

P2. Consider a similar situation, but now you realize the stranger litters and then drops a glove from a longer distance (about 13mts). Do you think you would help the stranger this time?

1. No, I would not.
2. Most probably not.
3. Most probably yes.
4. Yes, I am sure.

P3 is divided in two alternatives to each half of the sample. P3a. In particular, do you think having less time to decide encourages you to help? P3b. In particular, do you think having more time to decide would encourages you to help?

1. No, I do not think so.
2. Most probably not.
3. Most probably yes.
4. Yes, I think so.

P4. How long have you lived in The Netherlands? _____ (in years or months).

P5. How helpful do you consider the society of The Netherlands is?

1. Not helpful at all.
2. Just a little helpful.
3. Quite a lot helpful.
4. Highly helpful.

P6. How often do you come to Park Malieveld?

1. Less than once a week.
2. Once / Twice a week.
3. Three to five times a week.
4. More than five times a week.

P7. Age, _____ years.

P8. Gender,

1. Female.
2. Male.

C. Robustness checks

C.1 Cooperation

Table 9
Placebo test for cooperation: risk and height levels

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk	0.018		0.015	0.013	0.019		0.015	0.014
	(0.024)		(0.023)	(0.023)	(0.024)		(0.023)	(0.023)
Height		0.006	0.005	0.006		0.006	0.005	0.006
		(0.004)	(0.004)	(0.004)		(0.004)	(0.004)	(0.004)
Time-distance (long=1, short=0)				-0.186*				-0.172*
				(0.084)				(0.085)
Constant	0.552**	-0.323	-0.362	-0.326	0.549**	-0.354	-0.396	-0.358
	(0.147)	(0.735)	(0.734)	(0.724)	(0.147)	(0.736)	(0.735)	(0.725)
N	125				123			
Sample	Full				Acknowledged			
Demographic cov.				X				X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01
Source: author's estimation from Artavia (2015).

Table 10
Placebo test for cooperation: interaction term of risk levels

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Time-distance (long=1, short=0)	-0.375**	-0.375**	-0.405**	-0.375**	-0.375**	-0.406**
	(0.129)	(0.129)	(0.127)	(0.129)	(0.129)	(0.127)
Full sample risk (1=m>$\overline{m_{FS}}$; 0 = m≤$\overline{m_{FS}}$)	-0.181+	-0.143	-0.121			
	(0.105)	(0.106)	(0.106)			
Full sample interaction Distance*Risk	0.281+	0.313+	0.328+			
	(0.166)	(0.170)	(0.168)			
Age			0.005			0.005
			(0.003)			(0.003)
Male (=1, female=0)			0.106			0.116
			(0.089)			(0.089)
Country most lived (The Netherlands=1, other=0)			0.106			0.112
			(0.115)			(0.115)
Ack. sample risk (1=m>$\overline{m_{AS}}$; 0 = m≤$\overline{m_{AS}}$)				-0.143	-0.150	-0.129
				(0.106)	(0.107)	(0.108)
Ack. sample interaction Distance*Risk				0.316+	0.339*	0.355*
				(0.168)	(0.171)	(0.169)
Constant	0.833**	0.833**	0.459*	0.833**	0.833**	0.473*
	(0.077)	(0.077)	(0.185)	(0.077)	(0.077)	(0.189)
N	137	125	125	128	123	123
Sample		Full			Acknowledged	
Demographic covariates			X			X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

Table 11
Placebo test for cooperation: interaction term of height levels

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Time-distance (long=1, short=0)	-0.237+	-0.237+	-0.297*	-0.228+	-0.228+	-0.289*
	(0.123)	(0.123)	(0.125)	(0.124)	(0.124)	(0.127)
Full sample height (1=m>$\overline{m_{FS}}$; 0 = m≤$\overline{m_{FS}}$)	0.057	0.121	-0.004			
	(0.109)	(0.108)	(0.127)			
Full sample interaction Distance*Height	0.074	0.098	0.172			
	(0.165)	(0.167)	(0.171)			
Age			0.005			0.005
			(0.004)			(0.004)
Male (=1, female=0)			0.042			0.041
			(0.105)			(0.107)
Country most lived (The Netherlands=1, Other=0)			0.098			0.101
			(0.121)			(0.122)
Ack. sample height (1=m>$\overline{m_{AS}}$; 0 = m≤$\overline{m_{AS}}$)				0.136	0.136	0.005
				(0.108)	(0.108)	(0.135)
Ack. sample interaction Distance* Height				0.082	0.082	0.185
				(0.165)	(0.165)	(0.174)
Constant	0.686**	0.686**	0.422*	0.676**	0.676**	0.436*
	(0.080)	(0.080)	(0.167)	(0.082)	(0.082)	(0.169)
N	137	125	125	128	128	123
Sample		Full			Acknowledged	
Demographic cov.			X			X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

C.2 Indirect punishment

Table 12
Placebo test for indirect punishment: risk and height levels

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk	0.025		0.021	0.020	0.026		0.022	0.021
	(0.026)		(0.027)	(0.026)	(0.026)		(0.027)	(0.026)
Height		-0.001	-0.000	-0.001		-0.001	-0.001	-0.002
		(0.004)	(0.004)	(0.004)		(0.004)	(0.004)	(0.005)
Time-distance (short=0, long=1)				-0.169+				-0.162
				(0.100)				(0.100)
Constant	0.306*	0.546	0.390	0.691	0.304*	0.612	0.457	0.737
	(0.153)	(0.772)	(0.782)	(0.797)	(0.153)	(0.777)	(0.786)	(0.800)
N	108	105	104	104	107	104	103	103
Sample	Full				Acknowledged			
Risk + Height				X				X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

Table 13
Placebo test for indirect punishment: interaction term of risk levels

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Time-distance (long=1, short=0)	-0.101	-0.101	-0.100	-0.101	-0.101	-0.102
	(0.138)	(0.139)	(0.142)	(0.139)	(0.139)	(0.142)
Full sample risk (1=m>$\overline{m_{FS}}$; 0 = m≤$\overline{m_{FS}}$)	0.042	0.149	0.161			
	(0.131)	(0.140)	(0.136)			
Full sample interaction Distance*Risk	-0.057	-0.127	-0.133			
	(0.178)	(0.191)	(0.196)			
Age			0.001			0.001
			(0.004)			(0.004)
Male (=1, female=0)			-0.177+			-0.173+
			(0.100)			(0.100)
Country most lived (The Netherlands=1, Other=0)			0.075			0.061
			(0.137)			(0.142)
Ack. sample risk (1=m>$\overline{m_{AS}}$; 0 =m≤$\overline{m_{AS}}$)				0.097	0.149	0.160
				(0.133)	(0.140)	(0.137)
Ack. sample interaction Distance*Risk				-0.048	-0.113	-0.123
				(0.185)	(0.192)	(0.197)
Constant	0.458**	0.458**	0.449*	0.458**	0.458**	0.461*
	(0.103)	(0.104)	(0.214)	(0.103)	(0.104)	(0.217)
N	130	109	109	120	108	108
Sample		Full			Acknowledged	
Dem. controls			X			X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01

Table 14
Placebo test for indirect punishment: interaction term of height levels

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Time-distance (long=1, short=0)	-0.208	-0.208	-0.189	-0.196	-0.196	-0.184
	(0.139)	(0.139)	(0.140)	(0.140)	(0.140)	(0.141)
Full sample height (1=m>$\overline{m_{FS}}$; 0 =m≤$\overline{m_{FS}}$)	-0.130	-0.055	0.110			
	(0.134)	(0.143)	(0.166)			
Full sample interaction Distance*Height	0.099	0.067	0.046			
	(0.179)	(0.195)	(0.193)			
Age			0.001			0.001
			(0.003)			(0.003)
Male (=1, Female=0)			-0.262*			-0.256+
			(0.130)			(0.131)
Country most lived (The Netherlands=1, Other=0)			-0.006			-0.013
			(0.152)			(0.154)
Ack. sample risk (1=m>$\overline{m_{AS}}$; 0 =m≤$\overline{m_{AS}}$)				-0.084	-0.055	0.108
				(0.137)	(0.143)	(0.167)
Ack. sample interaction Distance*Height				0.102	0.055	0.042
				(0.187)	(0.196)	(0.194)
Constant	0.571**	0.571**	0.591**	0.571**	0.571**	0.599**
	(0.110)	(0.110)	(0.203)	(0.110)	(0.110)	(0.205)
N	130	109	109	120	108	108
Sample		Full			Acknowledged	
Demographic cov.			X			X

Notes: Robust standard errors in parenthesis. Stars denote significance levels at + p<0.1, *p<0.05, **p<0.01