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THE IMPACT OF CULTURE ON COOPERATION IN SOCIAL DILEMMAS

by
MONICA ELIE MOUGHABGHAB

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MONICA ELIE MOUGHABGHAB

Approved by:

	Signature
Dr. Ramzi Mabsout, Associate Professor Department of Economics	Advisor
	Signature
Dr. Ali Abboud, Assistant Professor Department of Economics	Member of Committee
	Signature
Dr. Sumru Altug, Professor and Chair Department of Economics	Member of Committee

Date of thesis defense: January 23, 2023

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Monica Elie Moughabghab

Date
January 26, 2023

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ABSTRACT
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Social dilemmas are situations in which individual and common interests are in conflict. In such situations, while individuals have an incentive to pursue their own short-term self-interests, individual payoffs are greater if the members of the group choose to cooperate and pursue the common interest instead. The social dilemmas literature suggests that trust has a direct and positive effect on cooperation in a given group, as it reduces fear of exploitation, making cooperation less risky. However, a stream of research in that literature also suggests that the effect of trust is not universal. The segregated nature of a collectivist society and its strong in-group ties promote trust in group members but discourage trust of outsiders. The opposite is true in individualist cultures where cross-group relationships are supported resulting in a higher level of generalized trust.

Multilevel modeling of data from the third wave of the joint EVS-WVS7 (2017-2022) tested the effect of trust across cultures for various measures of cooperation and defection including membership in a charitable or environmental organization, willingness to fight for the country, cheating on taxes, and claiming improper government benefits. The models account for countries' individualism score measured on the Hofstede scale of individualism for 58 different countries. Findings varied across the different cooperation variables, indicating that culture affects cooperation differently across countries depending on the level of trust of their citizens and the nature of cooperative action.

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CHAPTER 1

INTRODUCTION

1.1. Background of the Study

While there is arguably no disagreement about the importance of culture in social and individual life, views about the role that it plays in the life of homo economicus are not as uniform. Economists have various perspectives on the role that culture plays in determining economic outcomes and behavior, ranging from culture influencing whole economic systems to it being a byproduct of economic forces (Guiso et al., 2006).

Adopting cultural explanations of economic outcomes is not a novel approach: some early great economists like John Stuart Mill often recognized that cultural constraints can be even more important than the pursuit of personal interests (Mill, 1869). Max Weber (1905 [2001]) argued that culture can influence whole economic systems. Others, like Karl Marx, have reversed this direction of causality and claimed, instead, that culture is determined by economic relations, reducing it to a byproduct of the mode of production that shapes social, political, and intellectual life (Guiso et al., 2006). In fact, although culture was recognized as an important factor that influences decision-making and economic outcomes by early classical economists, its role was later downgraded by neoclassical economists who treated culture as a mere outcome of economic forces (Guiso et al., 2004, 2006). As economics increased its mathematical sophistication, there was reluctance to introduce additional explanatory variables (North, 2010).

More recently, however, the role of culture in economics has enjoyed a revival. Among numerous studies, Guiso et al., (2004) demonstrate that the level of social capital

affects the use of basic financial instruments such as writing a check or purchasing stocks. McCleary & Barro (2022) study the relation between religious beliefs and economic development. Guiso and authors (2006) include an intermediary step in their analysis and show that culture affects prior beliefs (expectations and preferences), which in turn affect economic outcomes.

In many studies that examine the effect of culture on economic outcomes, an important common element taken as a proxy for culture is the level of trust. To trust someone, in simple behavioral terms, is to refrain from taking precautions against them (Elster, 2015). One of the features of trust, according to Gambetta (2000), is the "subjective probability with which an agent assesses that another agent or group of agents will perform a particular action". This feature of trust allowed it to be incorporated into economic models, and it remains one of the most common variables of interest for economists as they explore the role of culture in determining economic outcomes.

Another important dimension of culture is individualism versus collectivism. This aspect of culture is not as recurrent in the economic literature as trust, but appears to have a significant influence on behavior, whether directly or indirectly (Berigan & Irwin, 2011, 2013). According to Greif (1994), a collectivist society is one where the social structure is segregated in the sense that each individual mainly interacts with members of a specific group (religious, familial, ethnic…) and feels involved in the life of other members of that group. Whereas in individualist societies, the social structure is integrated: individuals interact with members of various groups and shift frequently from one group to another. Individualism is commonly found in developed societies and is associated with better economic performance (Greif, 1994).

1.2. Objective of the Study

The aim of the study is to examine the impact of culture on behavior. Specifically, it aims to understand the effect of trust on cooperation in situations of social dilemmas, taking into consideration the nature of the culture: individualist or collectivist.

Social dilemmas are situations in which individual and common interests are in conflict. In such situations, while individuals have an incentive to pursue their own short-term self-interests, individual payoffs are greater if the members of the group choose to cooperate and pursue the common interest instead (Irwin & Berigan, 2013). Examples include the depletion of environmental resources, not bothering to vote, engaging in corrupt acts such as bribing and tax evasion (Bicchieri, 2005). In social dilemmas, the benefits of cooperation will only arise if most or all individuals cooperate. Thus, researchers from across the social sciences have tried to understand what generates cooperative behavior.

The social dilemmas literature suggests that trust has a direct and positive effect on cooperation in a given group, as it reduces fear of exploitation, making cooperation less risky. However, a stream of research in that literature also suggests that the effect of trust is not universal. The segregated nature of a collectivist society and its strong in-group ties promote trust in group members but discourage trust of outsiders. The opposite is true in individualist cultures where cross-group relationships are supported resulting in a higher level of generalized trust (Irwin & Berigan, 2013). As such, this study aims to understand how generalized trust impacts the level of cooperation across both individualist and collectivist societies. Specifically, multilevel modeling of data from the third version of the joint European Values Study and World Values Survey 2017-2022 allows to test the effect of trust and culture on the following variables, representing situations of social dilemma

where individuals can choose to either cooperate or defect: membership in humanitarian and environmental organizations, willingness to fight for the country, claiming improper government benefits, and cheating on taxes. Individualism and collectivism are measured through the Hofstede IDV Index which ranks countries according to their individualism score.

The findings suggest that the level of generalized trust is higher in individualist countries, but the level of cooperation varies according to the measure in question. For willingness to fight for the country, despite the positive mediating effect of trust on cooperation, individualism affects cooperation negatively. The findings suggest that collectivist societies have higher rates of cooperation for this measure. As for membership in charitable or humanitarian organizations, the effect of individualism is dependent upon the level of national trust: it is shown to have a positive effect on cooperation for higher levels of trust. For cheating on taxes, both the national trust level and the country's individualism score do not have any significant effect on cooperation. However, for the last measure of defection, collectivist countries seem to find claiming improper government benefits more justifiable than individualist countries.

1.3.Outline of the Study

The second chapter of this thesis presents a review of the literature and is split into two main sections. The first section explains social preferences and social dilemmas, while the second provides an overview of culture in the economic field as well as the impact of culture on cooperation in situations of social dilemmas. The third chapter presents the

methodology chosen for the study as well as the hypotheses that will be tested. The fourth chapter discusses the results of the analysis; and the last chapter provides a conclusion of the main results as well as the limitations and potential recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1. Social Preferences and Social Dilemmas

Beliefs, preferences, and constraints are three central principles of rational choice theory. Constraints represent limitations on an individual's set of possible actions. Beliefs form a causal structure that relates an individual's action to the probabilities of various possible outcomes resulting from it. Preferences play a role in the evaluation of the pros and cons of the different possible outcomes, and their ordering. Preferences, in rational choice theory, are assumed to be complete (comparable) and transitive (if A is preferred to B and B is preferred to C, A is preferred to C); and human behavior is assumed to result from the maximization of a preference function (Bowles & Gintis, 2011). Preferences are therefore considered to be at the root of the human decision-making process. However, rational choice theory does not capture, describe, or even refer to the underlying psychological and cognitive processes that generate human behavior. While the latter is more complex than a mere maximization of individual preferences, rational choice theory makes no psychological assumptions about behavior and is not concerned with the underlying reasons people have to behave the way they do (Binmore, 2007). It rather presents and describes these formal properties of the preference function in an analytically attractive and tractable way (completeness, transitivity, monotonicity…), and elaborates a solid applied aspect (Bowles & Gintis, 2011).

Rational choice theory assumes that economic agents are self-interested, in the sense that their choices are determined by the maximization of their own preference function and

according to their own unique preference ordering. However, these preferences are subjective and do not rule out concern for others' wellbeing as one's own utility may involve that of others. This can be observed in matters of cooperation, fairness, altruism, and many instances of daily life including voting, volunteering with dangerous military work, giving to charity, activism, and many complex situations where individuals forego their own personal benefit for the greater good and the benefit of others, or even engage in collective actions with little to no personal benefit (Bicchieri, 2005).

Game theory has amplified the range of testable models in economics by integrating the strategic interactions of agents in a multitude of situations. For instance, in the ultimatum game, players bargain over some amount, say 10$. A proposer offers part "x" of the amount to the responder, which can range between the full amount and zero. The responder then chooses to either accept or refuse the offer. If the responder accepts the offer, the proposer receives the rest of the amount (10-x) and the responder receives x. If the offer is rejected, both players receive nothing and the 10$ is lost. If agents aim to maximize their payoffs in this game, the predicted dominant strategy for the proposer is to offer the minimum amount, and for the receiver to accept that amount, whatever it is. This strategy is called a Nash equilibrium where each player's choice is the best response according to the actions of others (Camerer, 2003; Bowles & Gintis, 2011).

Several lab experiments tested the ultimatum game in different countries and obtained heterogeneous results (Henrich, 2000). In fact, some experiments showed that proposers offer 4-5$ out of 10$ on average, and offers of 2$ or less are mostly rejected. Arguably, the preference for a fair distribution of the sum pushes the responder to reject amounts that do not seem fair to them, thereby punishing the proposer for their unfair

behavior. The results persisted across multiple countries and with larger amounts of money (Camerer, 2003).

The ultimatum game is not a typical illustration of the process of most naturally-occurring bargaining but rather a representation of the last step in the process, and "a stepping stone for more complicated models" (Camerer, 2003). It is however undeniable that people do not act exclusively towards the maximization of their own benefit. Human beings are exceptionally cooperative species, in that their cooperation extends even towards complete strangers. They also feel the need to punish free-riders, and free-riding is often associated with a feeling of guilt. Such feelings and tendencies are termed *social preferences* (Bowles & Gintis, 2011).

2.1.1. Social Preferences

Bowles and Gintis (2011, p.3) define social preferences as "a concern, positive or negative, for the wellbeing of others, as well as a desire to uphold ethical norms". They are contrasted with self-regarding preferences, which are a concern for states related to oneself alone. Besides generosity and a preference for fair outcomes, social preferences also include a desire to improve our self-esteem, which is in part dependent on what others think of us. Therefore, social preferences can also be self-regarding. One can decide to be honest, generous, or fair for the wellbeing of others or to improve their own image. Whether the behavior is driven by the desire to increase self-esteem, pleasure resulting from improving the wellbeing of others, or guilt from acting selfishly, it is motivated by the individual's own social preferences. In fact, according to the definition of Bowles and Gintis, the

concern for states related to others can be positive or negative. Empathy, fairness, generosity, as well as hate, envy, and greed are all emotions generating a variety of social preferences that influence individuals' decisions and behavior (Bowles & Gintis, 2011).

The ultimatum game example discussed earlier is a one-shot game and so undermines the hypothesis that respondents reject offers to punish selfish respondents in the hope of getting higher offers in the next rounds. It also undermines the hypothesis that the proposer expects reciprocity if they give generous offers. Hence, two social preferences are recurrent in the interpretation of the results: altruism and benevolence. A pure altruist would donate all their money to the responder, provided they believe that their partner only cares about money. However, when one is benevolent, they care about both their own payoff and the other's, which implies that the utility of a benevolent increases as the utility of their partner increases. Therefore, a certain degree of benevolence might explain, in part, the proposer's degree of generosity. In fact, the results of the ultimatum game eliminate the pure altruism hypothesis, because people often do not give more than 50%, but do not eliminate the benevolence hypothesis (Bicchieri, 2005).

It is however worthy to note that the rejections of the respondents in the one-shot ultimatum game does not imply that they are not capable of strategic thinking; the respondent simply makes the choice of getting nothing or getting a small amount while the proposer gets much more (Camerer, 2003). Both respondents and proposers could exhibit a preference for fair outcomes, or an aversion to inequality (Bicchieri, 2005). Recent theories have balanced the desire to reciprocate unfairness with the desire to get more money, using social preferences functions (Camerer, 2003).

Similarly, in addition to the ultimatum game, the trust game has been widely tested in experiments by economists. In the trust game, the "truster" is awarded an amount of money and is given the opportunity to transfer any proportion of the amount to the "trustee". The experimenter then multiplies the initial amount by a determined factor, and transfers all of it to the "trustee". Assuming that the truster only cares about their personal payoff, and the trustee has the same self-regarding preferences, the truster will assume that the trustee will not return anything from the amount. Therefore, the truster will choose not to transfer anything to the trustee when given the opportunity. However, lab experiments have shown that trusters transfer significant proportions to the trustees who also return significant amounts to their co-players (Bowles & Gintis, 2011). The results of these experiments underline the importance of social preferences in explaining behavior and show that elements like trust play a crucial role in explaining strategic interaction.

2.1.2. Social Dilemmas: To Cooperate or To Defect?

As previously mentioned, self-interest can include the concern for the welfare of others. Nevertheless, this does not eradicate all possibility of conflict between two agents, and does not guarantee that the agents will always be able to cooperate for their mutual benefit (Axelrod, 2006). It is true that the assumption of concern for others alone does not solve the problem of when to cooperate and when not, however, models of social preferences are especially important in interactions termed social dilemmas (Bowles & Gintis, 2011).

Social dilemmas are situations in which the pursuit of self-regarding interests by each leads to a suboptimal outcome for all (Axelrod, 2006). The outcome resulting from the uncoordinated actions of players is said to be *Pareto inefficient*, which means that there exists another outcome where at least one agent is better off while no other agent is worse off (Bowles & Gintis, 2011). To understand such situations, game theory provides a general representation of instances that have this characteristic: the famous *prisoner's dilemma*.

The actions that players can take in the prisoner's dilemma fall under two categories: to cooperate or to defect (Bowles & Gintis, 2011). A cooperative action is an action of which the main aim is to increase collective interest; while a defective action is one that mainly aims to increase private or self-regarding interest. The possible set of actions and outcomes of each player depend on whether their friend cooperates or defects, but result in the same decision (Fujii, 2017).

The prisoner's dilemma is a suitable general representation of any situation of social dilemma as it satisfies the following two conditions that were specified in the first definition of social dilemmas by Dawes (1980):

(a) The payoff of defection for each agent is greater than the payoff of cooperation, no matter the decision taken by the other agent(s),

(b) yet, if all agents choose to defect, their payoff will be less than if all of them choose to cooperate (Dawes, 1991).

Dawes (1980, p.54) defines social dilemmas as "structures involving individually dominating strategies that converge on a deficient equilibrium". A dominating strategy is a decision of which the payoff is greater than that of all other decisions no matter what other

agents choose to do; and a deficient outcome is "an outcome that is less preferred by all choosers to some other outcome" (Dawes, 1980. p.54). Assuming none of the players in the prisoner's dilemma game have social preferences, mutual defection is the Nash equilibrium (Bowles & Gintis, 2011). However, players who have social preferences might adopt a different strategy than those who don't. As these players do not only care about their own payoff, but that of others as well, they might be more willing to accept a smaller benefit to allow a fairer outcome for other players, and therefore be more willing to cooperate. This is especially true if they believe that the other player is willing to cooperate. On the other hand, if they believe the other player is willing to defect, they will prefer to defect as well, to increase their own benefit and to punish the player who behaved selfishly. Therefore, including social preferences in the prisoner's dilemma model will create a new structure in which mutual defection and mutual cooperation are both Nash equilibria, and the prevailing equilibrium depends on the belief of each player about what the other will do (Bowles & Gintis, 2011)

In fact, evidence has shown that people are "*conditional cooperators*". They are neither purely altruistic nor selfish; their decision of whether to cooperate or defect depends largely upon their beliefs and expectations about the behavior of others (Bicchieri, 2005). In fact, these beliefs are at the heart of any strategic decision that players make in game theoretical models, and especially in situations of social dilemmas. Researchers around the world have studied how these beliefs impact the cooperation vs. defection decision, and how they vary from a society to another, and from a culture to another.

Culture could indeed play an important role in influencing beliefs, preferences, and in turn, cooperation. For instance, a popular line of argument is that social preferences such

as the preference for fair outcomes (observed in the ultimatum game) stem from the various cultural standards that are transmitted from one generation to the other through the process of socialization and traditions (Camerer, 2003).

2.2. Culture in Economics

As previously explained, the strategic interaction of agents in game theory as well as in daily life largely depends upon their beliefs about the behavior of others (North, 2010). For instance, coming back to experiments of the ultimatum game, a study by eleven anthropologists revealed that primitive cultures in Africa, Indonesia, the Amazon, Mongolia, and Papua New Guinea behaved differently from others: in these areas, people did not believe that a fair distribution of the allocated sum was necessary, and proposers offered a relatively small amount, while responders accepted almost any offer made. (Henrich, 2000; Camerer, 2003). In other words, these cultures did not exhibit a social preference for fair outcomes and the dominant strategy (or Nash equilibrium) was the maximization of one's own benefit. Indeed, results of the ultimatum game vary greatly across regions, societies, and cultures.

Another illustration is the trust game discussed previously because the results vary across different cultures as well. Some experiments revealed that when the ethnic, religious, or linguistic identity of the players is revealed, trusters in some communities tend to offer more to insiders than outsiders. This effect does not always persist when the partners are anonymous (Fershtman et al., 2005). Another set of experiments found no evidence of the insider-outsider discrimination in different communities (Bowles & Gintis, 2011). Trust is

therefore one of the key cultural elements influencing cooperation that vary across societies.

Social dilemma experiments demonstrate that cooperation rates depend upon the expected behavior of others and beliefs about their plans and intentions; and culture plays a key role in the formation process of these beliefs. In fact, cultures define the boundaries of personal space, and establish a standard for "normal" interactions which helps in predicting other's behavior, understanding the meaning behind it, and managing expectations (Bicchieri, 2005).

According to Bowles & Gintis (2011, p.13), culture is "the ensemble of preferences and beliefs that are acquired by means other than genetic transmission". Another current definition is that of Guiso, Sapienza, and Zingales (2006, p.23) which defines culture as the "customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation". A recurrent aspect in multiple definitions of culture is the relevance of beliefs. As seen in social dilemma experiments, beliefs are at the heart of agents' strategic interaction and have significant influence on their decision-making and behavior. Grief, for instance, defines cultural beliefs as the ideas and thoughts that govern interactions between individuals. Cultural beliefs are transmitted through the process of socialization by which culture is unified, maintained, and communicated (Greif, 1994). As culture plays a crucial role in defining and forming beliefs, it can be expected to have a significant impact on cooperation, especially in situations of social dilemma.

Recently, culture has enjoyed a revival in economics which, in its applied form, mainly focuses on identifying culture's effect on economic outcomes (Alesina & Giuliano, 2014). Among the most famous studies that examine the impact of culture are those by

Guiso, Sapienza, and Zingales. In their 2006 study, the authors claim that in making decisions with no previous experience, individuals rely on prior beliefs, and culture plays an important role in determining those beliefs. To measure culture, the authors use ethnicity and religion as instrumental variables, as these elements can be treated as constant over individuals' lifetime. Their results indicate a strong impact of religion and ethnicity on the level of trust, which in turn significantly influences economic outcomes such as entrepreneurship and saving. According to their analysis, trust has a positive and statistically significant effect on the probability of becoming an entrepreneur. As for saving, the authors examine the effect of culture on the preference for thriftiness through data from multiple waves of the World Values Survey (1981-84, 1990-93, and 1995-97), and measure the impact of this preference on the country's savings rate. Results show that a 10-percentage point increase in the number of people who value thriftiness leads to a 1.3 percentage point increase in national saving rate. The results also suggest that cultural variables have just as much explanatory power as economic variables in explaining cross-country differences in rates of savings (Guiso et al., 2006).

In another study by the same authors, culture is shown to significantly influence international bilateral trade. In fact, the authors demonstrate that a country that trusts another more tends to engage in more trade of goods, financial assets, and in direct investment, even after controlling for the typical (distance, border, language) as well as the recent variables (legal system origin) in the literature of international trade (Guiso et al., 2009).

2.2.1. The Power of Trust

As seen in previous examples, one of the most frequently studied cultural traits is generalized trust (Alesina & Giuliano, 2014). In addition to trust being a central aspect in game theoretical models and experiments, most empirical studies that aim to measure the impact of culture on economic outcomes either take the level of trust as a proxy for culture or include it as an intermediary step in the analysis. In fact, the importance of trust cannot be overemphasized (Alesina & Giuliano, 2014). Trust has been proven to increase the use of financial instruments, influence bilateral trade between countries, impact the portfolio of professional investors, encourage entrepreneurship, increase savings (Guiso et al., 2004, 2006, 2009), promote innovation (Fukuyama, 1996)….

According to Bicchieri (2004), trust is the "disposition to engage in social exchanges that involve uncertainty and vulnerability, but that are also potentially rewarding". Trust is often said to be the lubricant of society; simple everyday life would become considerably difficult in the absence of trust (Elster, 2015).

Trust varies according to multiple factors, including education level, religion, ethnicity, and many other cultural factors (Guiso et al., 2006; Irwin & Berigan, 2013). In their study about the role of culture in economic outcomes, Guiso and authors discover an important pattern concerning the effect of ethnicity on trust namely a strong positive correlation between the level of trust of US immigrants from different countries and the level of trust of nationals in these corresponding countries of origin. This is consistent with the theory that trust has a strong cultural aspect that affects people's beliefs and travels with them to new environments and persists several generations later (Guiso et al., 2006). It is however noteworthy that this strong effect of culture on trust weakens as the education

level increases, which means that more educated people rely less on their inherited culture in the process of forming their beliefs (Guiso et al., 2004).

2.2.2. Individualism and Collectivism

Alongside trust, another main dimension of culture, often considered to be the main cultural variation between countries by cross-cultural psychologists is individualism and collectivism. A collectivist culture is one where individuals mainly interact with members of specific groups, whether religious, ethnic, familial, and feel involved in the life of other members in that group (Greif, 1994). Due to the tight in-group ties and a "segregated" social structure, collectivist cultures discourage cooperation between various groups, but encourages collective action within groups. In fact, members of a group internalize the interests of the group and prioritize them sometimes over their own interests. However, by encouraging conformity, collectivism could discourage innovation and growth (Alesina & Giuliano, 2014). On the other hand, individualist cultures are associated with an "integrated" social structure where individuals of various groups frequently interact with each other and often shift from one group to another. Having a structure that encourages the pursuit of personal interests, individualism rewards innovation and personal accomplishments, thereby creating a favorable environment for economic growth and prosperity. In fact, individualism is commonly found in developed societies and is associated with better economic performance and growth (Greif, 1994). However, collective action is more difficult in individualist cultures where individuals put their

personal interests first and do not always internalize the interests of the collective (Alesina & Giuliano, 2014).

For instance, Bicchieri (2005) observed how different types of culture affect cooperation and contribution towards public goods. She gives the example of how different environmental activist messages are framed: along the Italian coasts, large beach posters display messages inviting people not to litter and pollute "your" sea. Whereas in Sweden, environmental messages always refer to protecting "our" environment. The more individualistic Italians seem to be more responsive to invitations to protect the private good, whereas Swedes seem to be more responsive to pleas for the common good (Bicchieri, 2005). Clearly, any society has both collectivist and individualist traits, and classification is a matter of the relative importance of each element (Greif, 1994).

2.2.3. Culture and Cooperation

Multiple studies have demonstrated that trust has a direct and positive effect on cooperation, as it reduces fear of exploitation, making cooperation less risky (Yamagishi & Sato, 1986). However, most of these studies examine the effect of *generalized trust*, or "*trust in most people*". In fact, two important features of trust that should be distinguished are the level of trust and the radius of trust. The level of trust is defined as the strength of cooperative norms and the radius of trust is the circle of people among whom cooperative norms are operative (Fukuyama, 1996). At any given radius, the higher the level of trust, the higher the cooperation it yields, and thus the level of trust is directly related to the intensity of cooperation. The radius of trust determines the width of the cooperative cycle;

in other words, when asked about trust in "most people", how wide the circle that respondents imagine is and who are those included in it. The radius of trust varies considerably across countries and determining exactly how wide the circle of trust remains a problematic approach. A study by Delhey and authors revealed that the rankings of some countries on trust were proven to change considerably when the standard question of trust in "*most people*" was changed to a radius-adjusted scale (Delhey et al., 2011).

In addition to the radius, an important factor accounting for the variation in the effect of trust across cultures is the sanctioning and monitoring system. The strong in-group ties of collectivist cultures facilitate sanctioning and monitoring systems and contract enforcement mainly happens through informal institutions (Greif, 1994). These systems promote trust of in-group members but discourage trust in outsiders. As for individualist cultures which are characterized by weak in-group ties, interactions between various groups are encouraged and are less frequently governed by monitoring systems. Contract enforcement mainly happens through specialized organizations, which promotes trust in "out-groups" or generalized trust (Irwin & Berigan, 2013). Therefore, the effect of trust on cooperation is not universal and is highly dependent on the type of culture and the nature and strength of group ties. As previously stated in experiments of the trust game, some communities were more trusting of insiders (or in-group members) versus outsiders (or out-group members) and were more willing to cooperate and offer more to insiders when their cultural identity was revealed (Bowles & Gintis, 2011).

Irwin and Berigan (2013) study the social dilemma of environmental protection. The previous literature suggests that trust directly promotes cooperation and encourages environmental conservation. In their study which was based on the 2010 wave of the

General Social Survey, a survey conducted in the United States that measures social characteristics and attitudes, the authors find an interaction between trust and the strength of social ties in affecting cooperation. Specifically, they find that the low level of generalized trust in collectivist cultures makes trust ineffective at promoting cooperation. However, in individualist cultures where generalized trust is higher, trust predicts cooperation (Irwin & Berigan, 2013).

In a previous study, the authors differentiate between first-order and second-order cooperation and argue again that culture influences cooperation in a given group through the amount of trust it generates. First-order cooperation is direct and voluntary contribution to the public good whereas second-order cooperation is rather the support for an enforcement mechanism that promotes first-order cooperation from all group members. Individualist cultures that have a higher level of generalized trust promote first-order cooperation (such as being a member of a charitable organization) whereas collectivist cultures demonstrate the preference for second-order cooperation (such as government welfare and redistribution programs) (Berigan & Irwin, 2011).

Following these previous findings, this study seeks to examine the effect of trust on cooperation in situations of social dilemma, and how this effect varies across cultures. In other words, the study will look at the extent to which individualism and collectivism affect the relationship between trust and cooperation. The following chapter details the hypotheses to be tested and the adopted methodology.

CHAPTER 3

DATA AND METHODOLOGY

3.1. Theory and Hypotheses

This study aims to examine how culture affects cooperation. Previous literature has shown that trust directly and significantly increases cooperation (Balliet & Van Lange, 2013; Irwin, 2009). However, most of these studies ignore the cultural aspect, namely individualism versus collectivism, which was proven to be of significant influence on cooperation (Irwin and Berigan, 2011, 2013; Irwin, 2009). Therefore, this study will examine the extent to which trust mediates the impact that culture has on cooperation, i.e., how the effect of trust on cooperation varies between collectivist and individualist societies.

Some of the variance in the effect of trust on cooperation across cultures can be attributed to the different sanctioning and monitoring systems. In collectivist cultures, as members of a specific group frequently interact with each other and have relatively close ties, multiple opportunities arise for monitoring and sanctioning in-group members. As such, members of the same group can expect that free-riding will be detected and will cooperate with members of their group. However, as individuals do not expect that interactions with out-group members will be monitored and that free-riding will be sanctioned, such interactions will be marked with uncertainty and individuals of a specific group will be less trusting of strangers (Irwin & Berigan, 2013). The opposite is true for individualist societies where individuals shift frequently from one group to another and have more opportunities to interact with strangers. Given the relative absence of monitoring

and sanctioning systems within their interactions, individualist cultures are less stifling of generalized trust. Thus, we can expect that generalized trust will be higher in individualist cultures than in collectivist ones.

Hypothesis 1: Collectivist cultures will have lower trust levels than individualist cultures.

The literature on trust has shown that trust enhances cooperation as it reduces fear of exploitation (Yamagishi & Sato, 1986). High-trusting individuals will be less wary of others during interactions due to a belief in the benign intentions of others and will expect them to reciprocate cooperation and thus will be more willing to cooperate.

Hypothesis 2: A higher level of generalized trust will yield a higher level of cooperation.

However, Berigan & Irwin (2011, 2013) found that the effect of trust on cooperation differs between individualist and collectivist cultures. That is, in individualist cultures where generalized trust is high, trust is expected to be a good predictor of cooperation. In collectivist societies where individuals are less trusting of strangers, trust is unlikely to predict cooperation which is more dependent on other mechanisms such as monitoring and sanctioning.

Hypothesis 3: In individualist cultures, trust is expected to be a predictor of cooperation. That is, a higher level of trust will yield higher cooperation. However, in collectivist cultures, trust is not expected to be a good predictor of cooperation, i.e., a higher level of trust does not necessarily yield a higher level of cooperation.

Under these hypotheses, trust plays a mediating role between culture and cooperation. That is, culture affects the level of trust, which then affects the willingness to

cooperate. Therefore, the analysis will be testing both the main effect of trust on cooperation, and its mediating effect between culture and cooperation.

The cooperation measure will include cases with social dilemmas in which individuals forego their own personal interest to cooperate with others for the greater, long-term common good, as well as cases addressing willingness to free-ride and defect at the expense of the common good. Thus, the chosen measures of cooperation in this study are: being a member of a humanitarian/charitable organization, being a member of an environmental organization, and willingness to fight for the country. As for the measures of defection, two variables feature: claiming improper government benefits and cheating on taxes.

3.2. Data and Analytical Approach

The data used in this study is from the third version of the joint European Values Study and World Values Survey (EVS-WVS) 2017-2022. The dataset incorporates joint data between the fifth wave of the EVS (2017-2020) which covers 36 countries and the seventh wave of the WVS (2017-2022) that covers 59 countries. This dataset will be used to measure the level of trust and cooperation. As for the measure of individualism, the study relies on the Hofstede individualism scale (*version 2015 12 08*) to rank countries according to their individualism score. The combination of data available in both sources results in a chosen sample of 58 countries with more than 76,700 respondents.

3.2.1. Variables

Independent variable: the primary explanatory variable in this study is the Hofstede individualism scale. Hofstede's cross-cultural framework provides measures for 6 dimensions of culture across countries. Among these dimensions, individualism represents "the extent to which people feel independent, as opposed to being interdependent as members of larger wholes". Hofstede's individualism index ranks 50 countries and 3 regions on a scale from 0 (most collectivistic) to 100 (most individualistic). The highest individualism scores were 91 for the United States, 90 for Australia, and 89 for Britain; and the lowest scores were 6 for Guatemala, 8 for Ecuador and 11 for Panama (Hofstede 2001). This study follows Berigan & Irwin (2011) and assumes a continuum between pure individualism and pure collectivism rather than treating the two aspects as a dichotomy.

Trust is captured using a question from the chosen dataset namely: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?".* Trust is considered a binary variable, coded 0 if the respondent answers "Need to be very careful" and 1 if the respondent answers "Most people can be trusted". Though this question is among the most popular measures of trust in the literature, it often raises the issue of the radius and whether it can be considered a measure of *generalized* trust. However, in the previously mentioned study by Delhey and authors, in 41 out of the 51 countries studied, "*most people*" referred to out-groups, and thus the standard WVS question about trust is a good measure of generalized trust or trust in others (Delhey et al., 2011)

Dependent variable: to assess the previously mentioned measures of cooperation, the study looks at a question that asks respondents whether they are active, inactive, or not

members of certain organizations. Among the mentioned organizations, we focus on membership in charitable/humanitarian organizations and environmental organizations. These two variables are coded dichotomously into 1 if the respondent is a member, or 0 if they are not. Additionally, to measure willingness to fight for the country, a question in the EVS-WVS asks "*Of course, we all hope that there will not be another war, but if it were to come to that, would you be willing to fight for your country?".* Responses are coded into 1 if the respondent answers Yes and 0 if they answer No. As for the measures of defection, willingness to cheat on taxes is measured by a question asking respondents how justifiable they think it is to cheat on taxes, on a scale from 1 (never justifiable) to 10 (always justifiable). Similarly, another question asks them how justifiable they think it is to claim government benefits which they are not entitled to, on the same scale.

Control variables: previous literature has shown that the following variables affect trust and cooperation: gender, age, religiosity, marital status, education, and confidence in the government (Berigan & Irwin, 2011). Gender and religiosity variables were coded dichotomously (1 for Female and 0 for Male, 1 for Religious and 0 for Not Religious or Convinced Atheist). Additionally, variables that account for respondent's household income (on a scale from 1 to 10) and employment status (1 for Employed and 0 for Unemployed) are added to control for their effect on respondents' ability to contribute to charitable or environmental organizations. The highest level of education attained was recoded to 3-level measure: lower education, middle education, and upper education. As for the measure of confidence in the government, it ranges on a scale from 1=None at all to 4=A great deal. This measure was added because a lack of faith in the government might create greater need for charitable activity (Berigan & Irwin 2011). It might as well

indirectly influence the two measures of defection: cheating on taxes and claiming improper government benefits. All these variables are measured and available in the EVS-WVS 2017-2022 dataset. Table 2 presents descriptive statistics for all 8 level-1 control variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Trust	1.000							
(2) Sex (Female)	-0.015*	1.000						
(3) Age	0.097*	-0.019*	1.000					
(4) Income	0.162*	-0.056*	-0.082*	1.000				
(5) Religious	-0.158*	0.081*	0.032*	-0.071*	1.000			
(6) Education Level	0.194*	-0.024*	-0.100*	0.311*	-0.138*	1.000		
(7) Gov. Confidence	0.132*	0.002	0.013*	0.011*	0.019*	-0.076*	1.000	
(8) Employed	0.046*	-0.165*	-0.254*	0.206*	-0.079*	0.172*	0.011*	1.000
Mean	0.326	0.516	45.471	5.022	0.594	2.054	2.376	0.599
Standard Deviation	0.469	0.5	16.905	2.359	0.491	0.781	0.931	0.49
Range	0-1	0-1	17-82	1-10	0-1	1-3	1-4	0-1

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 1. Correlations and Descriptive Statistics of Level-1 Control Variables

As for level-2 controls, the following variables were accounted for: GDP per capita which helps control for citizen's ability to contribute to humanitarian or environmental organizations, as well as the government's ability to provide for its citizens or take pro-environmental initiatives. Additionally, previous work shows a negative relation between population density and trust. Data for these variables was retrieved from The World Bank's website (for 2018). Moreover, literacy rates were controlled for at the level of the countries, as well as religiosity which was calculated by aggregating level-1 observations of individual religiosity.

Bivariate regressions were run for all level-2 controls, to test for their relationship with the aggregate measures[1] of the dependent variables, as well as the aggregate measure of trust. Results[2] were statistically significant at the 1% level for all level-2 controls, therefore, all of them were included in the final models.

3.2.2. Analytical Strategy

The hypotheses are tested through a multilevel modeling approach due to the nested nature of the cross-sectional dataset. Multi-leveling simultaneously tests for relationships between the variables across hierarchical levels of analysis, and requires the data to be organized in nested levels: level 1 observations should be contained within higher level 2 units. This is the case for this study where the level 1 unit is the respondent and the level 2 unit is the country. Multi-leveling controls for correlation among outcomes for individuals belonging to a same group and recognizes the dependence between observations, therefore avoiding an overstatement of statistical significance.

[1] As MLM aggregates level-1 dependent measures, bivariate regressions were focused on country-level averages for all dependent variables and trust
[2] Refer to section 1 of the Appendix

CHAPTER 4

RESULTS AND DISCUSSION

4.1. The relationship between individualism and trust

For the first hypothesis, a multilevel logistic model was run to test for the relationship between individualism and trust. The unconditional model[3] was statistically significant, suggesting that multilevel modelling is an appropriate approach. Table 2 (model 1) lists the results of the fixed effects model, showing statistically significant and positive relationships of trust and age, education level, income level, confidence in the government, employment status ($p<0.001$), and a negative and statistically significant relationship for religiosity ($p<0.01$). The gender variable was not statistically significant.

As for level-2 controls, the model shows a statistically significant negative relationship with literacy rate ($p<0.05$) and aggregate religiosity ($p<0.001$). The coefficient of GDP is statistically significant ($p<0.001$), although its relationship with trust is very precisely defined (OR=1.000).

The level-2 effect of the individualism score on aggregate trust is positive and marginally significant (OR = 1.008, p = 0.058). In other words, for every gain of one point on the Hofstede individualism scale, the national rate of those who find others trustworthy increases by 0.84%. For example, according to the model's estimates, the national rate of trust would be around 72.24% higher in New Zealand (individualism score = 79) than in Pakistan (individualism score = 14).

[3] Refer to section 2 of the Appendix

However not statistically significant at conventional levels, the findings indicate a positive relationship between trust and individualism, thereby initially supporting the first hypothesis that a higher individualism score for a given country is associated with a higher rate of generalized trust, and the more collectivist a country is, the lower its trust level will be.

Trust	**(Model 1)**	
	Estimated Odds Ratio	**Confidence Interval**
Level 1		
Female	0.978	[0.944,1.014]
Age	1.004***	[1.003,1.005]
Education Level (Scale of 3)	1.370***	[1.335,1.407]
Income Level	1.085***	[1.076,1.094]
Religious Person	0.937**	[0.901,0.975]
Employment Status	1.069***	[1.027,1.112]
Confidence in Government	1.370***	[1.341,1.401]
Level 2		
Hofstede IDV Score	1.008	[1.000,1.017]
GDP (per capita)	1.000***	[1.000,1.000]
Literacy Rate	0.984*	[0.971,0.998]
Population Density	1.000	[1.000,1.000]
Religiosity	0.196***	[0.0953,0.403]
N (individuals)	76750	
n (countries)	58	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. Individualism and Trust

4.2. The relationship between individualism and cooperation

The second and third hypothesis, which examine whether higher trust leads to higher cooperation and if this mechanism varies across individualist and collectivist

cultures, is tested through hierarchical logistic models. The following sections list the results of the models for all dependent variables: willingness to fight for the country, membership in a charitable organization, membership in an environmental organization, cheating on taxes, and claiming improper government benefits.

4.2.1. Willingness to fight for the country

The study follows Berigan and Irwin's (2011) approach in estimating two models where the first one examines the relationship between individualism and willingness to fight for the country, and the second one focuses on trust as a mediating variable between individualism and the dependent measure of cooperation. A third model is included where the interaction of trust and the dependent variable, willingness to fight for the country, is added. Table 3 lists the estimates of the three models.

At level 1, Model 2 shows a negative and statistically significant effect of gender (female) ($p < 0.001$) and education level ($p < 0.001$) on willingness to fight for the country. As for income level, religiosity, confidence in the government, and employment status, a positive relationship with the willingness to fight for the country is observed, statistically significant at the 0.1% level. As for level 2, a negative relationship for literacy rate is detected, significant at the 5% level. None of the other level-2 variables are statistically significant (GDP, density, religiosity).

The level-2 effect of the Hofstede IDV score is negative and marginally statistically significant (OR = 0.988, $p = 0.056$). In other terms, every one unit increase in the individualism score, there is a 1.2% decrease in the national level of willingness to fight for

the country. For example, according to the estimates of Model 2, the national rate of willingness to fight for the country is 55.46% lower in Hungary (IDV score = 80) than in Columbia (IDV score = 13).

Willingness to Fight for Country	(Model 2)		(Model 3)		(Model 4)	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
Level 1						
Trust	0.976	[0.938,1.016]	0.975	[0.937,1.015]	0.975	[0.937,1.015]
Female	0.498***	[0.481,0.515]	0.498***	[0.481,0.515]	0.498***	[0.481,0.515]
Age	0.999	[0.998,1.001]	0.999	[0.998,1.001]	0.999	[0.998,1.001]
Income Level	1.022***	[1.014,1.030]	1.022***	[1.014,1.030]	1.022***	[1.014,1.030]
Religious Person	1.394***	[1.342,1.448]	1.394***	[1.342,1.448]	1.394***	[1.342,1.448]
Education Level	0.952***	[0.928,0.977]	0.952***	[0.929,0.977]	0.952***	[0.928,0.977]
Confidence in Gov.	1.266***	[1.240,1.293]	1.266***	[1.240,1.292]	1.266***	[1.240,1.292]
Employment Status	1.114***	[1.074,1.156]	1.114***	[1.074,1.156]	1.114***	[1.074,1.156]
Level 2						
IDV Score	0.988	[0.976,1.000]	0.986*	[0.975,0.998]	0.981*	[0.963,0.999]
GDP (per capita)	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Literacy Rate	0.978*	[0.959,0.997]	0.983	[0.964,1.002]	0.984	[0.965,1.003]
Population Density	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Religiosity	0.888	[0.317,2.482]	1.731	[0.554,5.405]	1.525	[0.470,4.946]
Aggregate Trust			9.016*	[1.371,59.32]	3.259	[0.137,77.39]
IDV Score # Aggregate Trust					1.022	[0.968,1.079]
N (individuals)	76750		76750		76750	
n (countries)	58		58		58	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3. Individualism and willingness to fight for the country

Despite the initial evidence in favor of the first hypothesis, the estimates of the multilevel models show that more individualistic countries are not necessarily associated with a higher level of cooperation at both the individual and country levels. In fact, despite trust levels being higher in individualist countries, willingness to fight for the country is lower in countries with a higher IDV score. This negative effect of individualism on cooperation becomes statistically significant at the 5% level when the level-2 control for aggregate trust is included in Model 3.

In Models 3 and 4, the effects of level-1 variables remain similar to those of Model 2: a negative and statistically significant effect of gender and education level, and a positive and statistically significant effect of income, employment, religiosity, and confidence in the government. The level 2 control for literacy rate loses its statistical significance in Models 3 and 4. However, the added measure of the national trust level in Model 3 is positive and statistically significant (OR = 9.016, $p < 0.05$), meaning that countries with higher average levels of trust have a higher willingness to fight for the country. This is however not the case in Model 4, where both the national trust level and its interaction effect with individualism are not significant. It is also worth noting that the individual measure of trust (at level 1) is still not statistically significant for willingness to fight for the country in any of the three models.

According to the estimates of the third model, it appears that a higher individualism score is not associated with higher cooperation across the sample of countries. On the contrary, it seems that collectivist societies are more willing to fight for their country. However, when looking at the mediating effect of trust in model 3, it seems that trust has a mediating effect between individualism and this measure of first-order cooperation:

individualism increases trust (findings of Table 2), and trust increases willingness to fight for the country. In Model 4, when the interaction effect is added, the national level of trust loses its statistical significance.

4.2.2. Membership in a Charitable Organization

Table 4 lists the results of three hierarchical logistic models testing the relationship between individualism and membership in a charitable organization. The sixth model includes a measure of aggregate trust as a mediating variable between individualism and cooperation, and the seventh model includes the interaction effect of aggregate trust and individualism.

The three models show a positive and statistically significant relationship between membership in a charitable organization and all level-1 controls: trust, gender (female), age, income level, religiosity, education, confidence in the government ($p < 0.001$), and employment status ($p<0.05$). Additionally, all models show a negative and statistically significant relationship of literacy rate and cooperation at level 2 ($p < 0.01$).

In models 5 and 6, the coefficient of individualism is not statistically significant. Similarly, the coefficient of aggregate trust is not statistically significant in Model 6, despite a positive and highly significant relationship of trust and cooperation at level 1. However, in Model 7 where the interaction of IDV score and aggregate trust is added, both the individualism score, the national level of trust, and their interaction are highly statistically significant ($p < 0.001$).

The positive interaction effect of individualism and aggregate trust indicates that individualism has a positive effect on cooperation, here, membership in a charitable organization, for higher levels of aggregate trust. That is, when the national level of trust is high, an increase in the IDV score is associated with an increase in cooperation. For instance, taking the examples of Argentina (national trust = 17.83%, IDV= 46) and the Netherlands (national trust = 64.81%, IDV = 80): when holding the level of trust constant at 64.81%, each one-point increase in the IDV score is associated with a 4.39% increase in the level of cooperation. However, when the trust level is held constant at the lower level of 17.83%, each one-point increase in individualism is associated with a 1.95% decrease in the level of cooperation.

Membership in a Charitable Organization	(Model 5)		(Model 6)		(Model 7)	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
Level 1						
Trust	1.500***	[1.429,1.574]	1.501***	[1.430,1.575]	1.501***	[1.430,1.575]
Female	1.099***	[1.056,1.145]	1.099***	[1.056,1.145]	1.099***	[1.056,1.145]
Age	1.004***	[1.003,1.005]	1.004***	[1.003,1.005]	1.004***	[1.003,1.005]
Income Level	1.032***	[1.023,1.042]	1.032***	[1.023,1.042]	1.032***	[1.023,1.042]
Religious Person	1.447***	[1.380,1.517]	1.447***	[1.380,1.517]	1.447***	[1.380,1.517]
Education Level	1.302***	[1.264,1.342]	1.302***	[1.264,1.342]	1.302***	[1.263,1.341]
Confidence in Gov.	1.084***	[1.058,1.111]	1.085***	[1.059,1.111]	1.085***	[1.059,1.111]
Employment Status	1.047*	[1.001,1.094]	1.047*	[1.001,1.094]	1.047*	[1.002,1.094]
Level 2						
IDV Score	0.990	[0.975,1.005]	0.991	[0.976,1.006]	0.957***	[0.938,0.977]
GDP (per capita)	1.000	[1.000,1.000]	1.000*	[1.000,1.000]	1.000	[1.000,1.000]
Literacy Rate	0.968**	[0.946,0.991]	0.965**	[0.942,0.989]	0.972**	[0.952,0.993]
Population Density	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Religiosity	0.985	[0.280,3.465]	0.670	[0.158,2.838]	0.304	[0.0831,1.115]
Aggregate Trust			0.284	[0.0262,3.073]	0.000515***	[0.0000158,0.0168]
IDV Score # Aggregate Trust					1.143***	[1.077,1.212]
N (individuals)	76750		76750		76750	
n (countries)	58		58		58	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Individualism and membership in a charitable organization

4.2.3. Membership in an Environmental Organization

Table 5 shows the estimates of the hierarchical logistic models testing for the relationship between membership in an environmental organization and individualism. The following level-1 controls were found to have a positive and statistically significant relationship at the 0.1% level: trust, religiosity, education, and confidence in the

government, and at the 1% for income level. The negative and statistically significant relationship of literacy rate at level 2 found in the previous models also holds for membership in an environmental organization.

Lastly, similar to the findings for membership in a charitable organization, at the country level, individualism and aggregate trust were found to have no statistically significant effect on membership in an environmental organization. Additionally, when the interaction of the national trust level and the individualism score is included in Model 10, the two predictors and their interaction become highly statistically significant.

The findings of Model 10 further validate that an increase in the individualism score can be associated with an increase of the cooperation level in countries for which the national trust level is high. For example, taking Greece (national trust = 8.87%, IDV= 35) and Sweden (national trust = 68.08%, IDV = 71): when holding the level of trust constant at 68.08%, each one-point increase in the IDV score is associated with a 4.73% increase in the level of cooperation. However, when the trust level is held constant at the lower level of 17.83%, each one-point increase in individualism is associated with a 3.44% decrease in the level of cooperation.

Membership in an Environmental Organization	(Model 8)		(Model 9)		(Model 10)	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
Level 1						
Trust	1.512***	[1.431,1.597]	1.513***	[1.432,1.598]	1.513***	[1.432,1.598]
Female	0.986	[0.942,1.032]	0.986	[0.943,1.032]	0.986	[0.942,1.032]
Age	0.999	[0.998,1.001]	0.999	[0.998,1.001]	0.999	[0.998,1.001]
Income Level	1.015**	[1.005,1.026]	1.015**	[1.005,1.026]	1.015**	[1.005,1.026]
Religious Person	1.129***	[1.070,1.190]	1.128***	[1.070,1.190]	1.128***	[1.070,1.190]
Education Level	1.183***	[1.144,1.223]	1.183***	[1.144,1.223]	1.182***	[1.143,1.222]
Confidence in Gov.	1.097***	[1.067,1.127]	1.097***	[1.067,1.127]	1.097***	[1.067,1.127]
Employment Status	1.024	[0.974,1.076]	1.024	[0.974,1.076]	1.024	[0.975,1.076]
Level 2						
IDV Score	0.988	[0.972,1.003]	0.988	[0.973,1.004]	0.954***	[0.935,0.974]
GDP (per capita)	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Literacy Rate	0.966**	[0.943,0.989]	0.962**	[0.939,0.986]	0.969**	[0.949,0.990]
Population Density	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Religiosity	0.810	[0.223,2.936]	0.532	[0.121,2.331]	0.233*	[0.0619,0.878]
Aggregate Trust			0.256	[0.0226,2.911]	0.000386***	[0.0000112,0.0133]
IDV Score # Aggregate Trust					1.147***	[1.080,1.218]
N (individuals)	76750		76750		76750	
n (countries)	58		58		58	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. Individualism and membership in an environmental organization

The last two variables represent cases of defection, when one prefers to increase their own benefit at the expense of the common good. The following two sections present the results of hierarchical ordered logistic models which examine the effect of culture on

how justifiable respondents think it is to cheat on taxes or claim government benefits which they are not entitled to.

4.2.4. Cheating on Taxes

Cheating on Taxes	(Model 11)		(Model 12)		(Model 13)	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
Level 1						
Trust	1.091***	[1.053,1.130]	1.091***	[1.053,1.130]	1.091***	[1.053,1.130]
Female	0.817***	[0.793,0.842]	0.817***	[0.793,0.842]	0.817***	[0.793,0.842]
Age	0.987***	[0.986,0.988]	0.987***	[0.986,0.988]	0.987***	[0.986,0.988]
Income Level	1.010**	[1.003,1.017]	1.010**	[1.003,1.017]	1.010**	[1.003,1.017]
Religious Person	0.906***	[0.875,0.937]	0.906***	[0.875,0.937]	0.906***	[0.875,0.937]
Education Level	0.913***	[0.893,0.933]	0.913***	[0.893,0.933]	0.913***	[0.893,0.933]
Confidence in Gov.	0.928***	[0.911,0.945]	0.928***	[0.911,0.945]	0.928***	[0.911,0.945]
Employment Status	1.070***	[1.036,1.106]	1.070***	[1.036,1.106]	1.070***	[1.036,1.106]
Level 2						
IDV Score	1.001	[0.991,1.011]	1.002	[0.992,1.012]	0.997	[0.982,1.013]
GDP (per capita)	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Literacy Rate	1.019*	[1.003,1.035]	1.018*	[1.001,1.034]	1.019*	[1.002,1.035]
Population Density	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Religiosity	1.315	[0.572,3.021]	1.145	[0.438,2.991]	1.040	[0.385,2.807]
Aggregate Trust			0.635	[0.130,3.108]	0.293	[0.0203,4.239]
IDV Score # Aggregate Trust					1.017	[0.971,1.064]
N (individuals)	76750		76750		76750	
n (countries)	58		58		58	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Individualism and cheating on taxes

Models 11, 12, and 13 of Table 6 show a positive and statistically significant relationship with the respondent's perception of how justifiable it is to cheat on taxes at level 1 for trust, employment status ($p < 0.001$), and income level ($p < 0.01$). Additionally, a negative and statistically significant relationship is observed for gender, age, religiosity, education, and confidence in the government ($p < 0.001$).

At level 2, a positive and statistically significant relationship is observed between literacy rate and the country level's perception of how justifiable it is to cheat on taxes ($p < 0.05$). Individualism and aggregate trust were found to have no statistically significant effect for this measure of defection. This finding remained unchanged when the interaction of trust and individualism was added in Model 13.

4.2.5. Claiming Improper Government Benefits

For the second measure of defection, that is, how justifiable it is to claim government benefits which the respondent is not entitled to, models 14, 15, and 16 show a positive and statistically significant relationship for trust ($p < 0.01$). Additionally, a negative and statistically significant relationship is observed for gender, age, income level, and education level ($p < 0.001$).

At level 2, similar to the previous variable, a positive and statistically significant relationship is observed between literacy rate and the country level's perception of how justifiable it is claim improper government benefits ($p < 0.01$). However, a negative and statistically significant effect is observed for the individualism score ($p < 0.05$) in Models 14 and 15, meaning that countries with a higher individualism score are less likely to find

claiming improper benefits justifiable. For example, claiming government benefits which you are not entitled to is perceived to be 66.3% less justifiable in Great Britain (IDV=89), than in Taiwan (IDV=17). In Model 15, the level 2 effect of aggregate trust was not significant. Finally, in Model 16, when the interaction of individualism and trust is added, it is shown to have no statistically significant effect, and the individualism score loses its statistical significance.

Claiming Improper Government Benefits	(Model 14)		(Model 15)		(Model 16)	
	Odds Ratio	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**	**Odds Ratio**	**Confidence Interval**
Level 1						
Trust	1.047**	[1.012,1.083]	1.048**	[1.013,1.084]	1.048**	[1.013,1.084]
Female	0.911***	[0.886,0.938]	0.911***	[0.886,0.938]	0.911***	[0.886,0.938]
Age	0.982***	[0.981,0.983]	0.982***	[0.981,0.983]	0.982***	[0.981,0.983]
Income Level	0.986***	[0.979,0.992]	0.986***	[0.979,0.992]	0.986***	[0.979,0.992]
Religious Person	0.979	[0.947,1.012]	0.979	[0.947,1.012]	0.979	[0.947,1.012]
Education Level	0.886***	[0.867,0.904]	0.886***	[0.867,0.904]	0.886***	[0.867,0.904]
Confidence in Gov.	0.992	[0.975,1.010]	0.992	[0.975,1.010]	0.992	[0.975,1.010]
Employment Status	0.996	[0.965,1.027]	0.996	[0.965,1.027]	0.996	[0.965,1.027]
Level 2						
IDV Score	0.985*	[0.973,0.997]	0.986*	[0.974,0.998]	0.985	[0.966,1.004]
GDP (per capita)	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Literacy Rate	1.029**	[1.010,1.049]	1.027**	[1.007,1.048]	1.028**	[1.007,1.048]
Population Density	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Religiosity	0.687	[0.249,1.896]	0.543	[0.169,1.747]	0.534	[0.159,1.794]
Aggregate Trust			0.461	[0.0667,3.188]	0.399	[0.0152,10.46]
IDV Score # Aggregate Trust					1.003	[0.949,1.061]
N (individuals)	76750		76750		76750	
n (countries)	58		58		58	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Individualism and cheating on taxes.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1. Main findings

The findings of this study initially confirm that more individualistic countries tend to have higher levels of generalized trust. Additionally, trust is shown to increase with an individuals' age, education, income, employment, and their confidence in the government, but decreases with religiosity both at the individual level and the national level.

The results of the models assessing the relationship between cooperation and individualism vary according to the measure of cooperation in question. Different categories of cooperation and defection are studied: willingness to fight for the country, membership in a charitable organization, membership in an environmental organization, cheating on taxes, and claiming improper government benefits. The first measure, willingness to fight for the country, is a measure of first-order cooperation as it requires that an individual foregoes their personal interest and contributes directly to the common good (here, defending the country in times of war). A negative relationship is found between individualism and this measure of cooperation. This finding conflicts with the hypotheses that follow previous similar studies and that confirm a positive relationship between individualism and first-order cooperation (Berigan & Irwin, 2011, 2013). However, other studies have also found collectivist countries to be more willing to cooperate for the common good than individualist countries: for example, collectivist societies showed higher rates of adherence to COVID-19 policies and safety, and individualist countries had higher rates of COVID-19 prevalence and fatality (Rajkumar, 2021; Maaravi et al., 2021).

This was explained by the stronger in-group ties of collectivist societies, who internalize the interests of the collective and often prioritize them over their own benefit, whereas individualist societies are more oriented towards their personal interests and often fail to sacrifice their own benefit for that of the collective (Alesina & Giuliano, 2014).

Nevertheless, when the national trust level is accounted for, it is shown to be positively related to cooperation as measured by the willingness to fight for country, thereby initially revealing a mediating effect between individualism and cooperation. As a higher individualism score is associated with a higher level of generalized trust, and higher trust level increases cooperation, trust can be considered as a mediator between a country's culture and its degree of cooperation.

This is further confirmed through the estimates of the second and third measures of cooperation, membership in a charitable and environmental organization. The models in which an interaction effect of the national trust level and the individualism score is added reveal that individualism increases cooperation for higher levels of national trust. That is, when the national level of trust is held constant at a high level, an increase in individualism is associated with an increase in cooperation. However, when the national trust level is low, an increase in individualism is associated with a decrease in cooperation. The significance of the interaction of the two independent variables shows that the relationship between culture and cooperation is dependent upon the level of trust, and the relationship between trust and cooperation depends upon the nature of the culture.

The last two variables examined the effect of culture on how justifiable respondents think it is to cheat on taxes or claim government benefits which they are not entitled to. These variables represent cases where individuals defect and pursue their own benefits at

the expense of the common good. For the tax measure, no relationship was found for the national level of trust or the individualism score as none of the estimates were significant. However, for the government benefits measure, the findings indicate that individualist countries find it less justifiable to claim government benefits they are not entitled to than collectivist countries. The national level of trust was found to have no effect on this variable, despite a significantly positive effect of the individual level of trust for both of these measures.

More research is needed to understand the nature of the relationship between individualism and cooperation, but the results of this study show that a country's degree of individualism cannot be directly associated to the level of cooperation or willingness to cooperate or defect of its people. In some instances of social dilemma, collectivist cultures were shown to put the interest of the collective before individual interests and cooperate for the common good (Alesina & Giuliano, 2014). While in other instances, individualist cultures, which promote and encourage interaction between various groups, were shown to encourage cooperation more. In fact, collectivist cultures can discourage cooperation between various groups, but encourage cooperation between members of the same group (Alesina & Giuliano, 2014). Therefore, the radius of these said groups plays a major role in determining the degree of cooperation of collectivist cultures.

5.2. Limitations

This study relies exclusively on the Hofstede cultural dimensions for the measure of individualism, which might not be exactly representative of how individualistic and

collectivistic communities are. Hofstede's cultural dimensions, although a cornerstone in the field of cross-cultural research, are based on questionnaire data that assesses the central tendencies of the societies as a whole. These central tendencies are the basis of cultural comparison and assessment of the countries, and might not reflect their real cultural composition, especially for segregated or mixed societies.

Furthermore, some countries with a low individualism score, such as China, are developing rapidly. While the predominantly collectivistic culture preserves strong in-group ties, a rapid development can promote individualistic values that may emerge even in traditional societies. Therefore, in mixed collectivist societies, it is not uncommon to find individualistic dynamics especially in large metropolitan areas. These dynamics make it difficult to establish a link between this aspect of a country's culture, and the level of cooperation of its citizens.

Additionally, the lower rates of cooperation for willingness to fight for the country were found in countries with a higher individualism score. This lower willingness to defend the country in times of war could be attributed to low-risk perceptions of people living in more individualistic countries, which tend to be more developed, stable, and secure. The same logic could apply to the second measure of defection which examines how justifiable people think it is to claim government benefits which they are not entitled to. This measure was lower in individualist countries, and higher in more collectivist countries that tend to be less developed and often more corrupt at the level of the government, creating a perception that it is justifiable to claim government benefits that people are not entitled to, as well as a higher demand for government support and benefits.

Lastly, future research should seek to further examine the extent to which individualism and collectivism impact individuals' level of trust, as well as their willingness to cooperate or defect in situations of social dilemma. To form a better understanding of the effect of culture on cooperation, future studies should especially focus on the rapidly evolving cultural dynamics in more traditional societies and how this change affects the level of trust and the coordination of efforts to solve social dilemmas.

APPENDIX

1. Bivariate regressions for all level-2 controls

	(1) Aggregate Trust	(2) Willingness to Fight for Country (Aggregate)	(3) Environmental Org. Membership (Aggregate)	(4) Charitable Org. Membership (Aggregate)	(5) Claiming Improper Gov. Benefits (Aggregate)	(6) Cheating on Taxes (Aggregate)
GDP (per capita)	0.00000595***	-0.00000147***	0.000000587***	0.00000148***	-0.0000266***	-0.00000908***
	(1.96e-08)	(2.58e-08)	(1.71e-08)	(1.92e-08)	(0.000000447)	(0.000000384)
Literacy Rate	-0.00250***	-0.00357***	-0.00235***	-0.00258***	0.0198***	0.0147***
	(0.0000416)	(0.0000547)	(0.0000364)	(0.0000407)	(0.000950)	(0.000816)
Population Density	-0.0000311***	0.00000376***	-0.00000397***	-0.00000916***	0.000111***	0.00000921
	(0.000000255)	(0.000000335)	(0.000000223)	(0.000000249)	(0.00000582)	(0.00000500)
Religiosity	-0.393***	0.0420***	0.0346***	0.0669***	-0.232***	0.520***
	(0.00201)	(0.00265)	(0.00176)	(0.00197)	(0.0459)	(0.0394)
Constant	0.641***	1.034***	0.313***	0.337***	1.658***	0.734***
	(0.00440)	(0.00579)	(0.00385)	(0.00431)	(0.100)	(0.0862)
R^2	0.761	0.195	0.073	0.107	0.049	0.015

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2. Unconditional Models

	(1) Trust	(2) Willingness to Fight for Country	(3) Charitable Org. Membership	(4) Environmental Org. Membership	(5) Claiming Improper Gov. Benefits	(6) Cheating on Taxes
main						
Constant	-1.057***	0.900***	-1.936***	-2.361***	2.734***	2.167***
	(0.145)	(0.113)	(0.124)	(0.130)	(0.133)	(0.0774)
/						
var(_cons[country])	1.206***	0.733***	0.873***	0.958***		
	(0.226)	(0.138)	(0.166)	(0.183)		
lns1_1_1						
Constant					0.0100	-0.534***
					(0.0933)	(0.0938)
lnsig_e						
Constant					0.821***	0.694***
					(0.00255)	(0.00255)
R^2						

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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