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THE RELATIVE RELEVANCE OF TRUST

Revisiting the relationship between trust and cooperation for the environment in large-scale collective action dilemmas

Erik Jönsson

Abstract

Many global environmental problems can be understood as collective action dilemmas which ultimately requires cooperation in order for them to be resolved. Due to certain stressors associated with large-scale collective action for the environment it is unlikely that cooperation will occur. However, in large-scale dilemmas, where involved actors typically have no abilities to communicate or to sanction defective behaviour, trust has been found to facilitate cooperation. But most of these findings stem from research carried out in contexts where societal trust is high. Because of substantial variation in trust-levels among countries there is reason to question whether the relationship also hold in contexts where societal trust is low. A theoretical framework recognizing trust both as a societal feature and an individual trait is elaborated in order to test how generalized social trust and political-institutional trust affect first- and second-order cooperation. Using survey data from European Values Study, results from multilevel analyses show that generalized social trust is positively linked to both first- and second-order cooperation, whereas political-institutional trust only is linked to second-order cooperation. However, putting trust-context under scrutiny reveals that generalized social trust and political-institutional trust are only linked to cooperation in high-trust countries. In low-trust countries, neither generalized social trust nor political-institutional trust helps to explain cooperation for the environment. As such, this thesis sheds some new light upon the role of trust in large-scale collective action dilemmas, and deepens our understanding as to how trust influence individual propensity to cooperate for the environment.

Keywords: Large-scale environmental collective action, cooperation, social trust, political-institutional trust, trust-context.

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1. INTRODUCTION

Published in 2018, the 'Special Report' by the Intergovernmental Panel on Climate Change stated that in order to limit global warming to 1.5°C above pre-industrial levels the world community would have to implement far-reaching transitions in all aspects of society of a scale previously unprecedented (IPCC, 2018). Global average temperatures reached one degree above pre-industrial levels in 2015 (Hawkins et al., 2017). According to the IPCC report, if we are to stay on the pathway of keeping the average global warming below 1.5°C by the year of 2100 we have to cut emissions by 45 percent compared to 2010 levels and reach net-zero emissions by 2050 (2018, p. 12). The growth rate of carbon dioxide emissions has slowed down, but the rate is still positive (Peters et al., 2020). Thus, it should be in the world community's deepest interest to radically lower global emissions, yet it is not happening. At least not sufficiently enough.

A common way to understand the inaction in reducing emissions and the mitigation of global warming is to frame it as a collective action dilemma (Duit, 2010; Fairbrother, 2016; Jagers et al., 2019). A collective action problem is typically described as a situation where the benefits for society are highest if all actors cooperate, while any one actor receives a higher payoff if they choose not to cooperate (Dawes, 1980).

In short, collective action problems occur when individuals' incentives are not in line with those of the collective (Sethi, 2010) and can be illustrated by a simple example of a group of herdsmen and their sheep, as described by Garrett Hardin in his famous article *The Tragedy of the Commons* (1968). The additional utility given to any one individual herdsman who choose to introduce one extra sheep on the pasture land is nearly +1. Apart from the positive utility, the extra grazing that comes with the introduction of one additional sheep also entails a negative utility of -1. However, the negative utility is shared among all herdsmen. The utility net sum are thus positive for any one individual herdsman that chooses to introduce one additional sheep on the pasture land. This is where the 'tragedy' occurs since incentives facing individual herdsmen makes it rational for them to keep introducing extra sheep, a behaviour which ultimately will lead to the depletion of grazable land, and the possibilities for the collective to continue their activities will therefore cease to exist (Hardin, 1968).

Early solutions to these types of dilemmas focused on strong institutions intended to alter the behaviour among actors. Among them where proposals to alter payoff structures (Dawes, 1980), imposing coercive measures by external enforcers (Hardin, 1968) and implementing selective incentives, rewarding those who cooperate (Olson, 1965). Underpinning these early

solutions is the idea that actors' rational self-interest prevents any attempts at overcoming social dilemmas. Self-interest is considered to be such a strong motivator that 'softer' social mechanisms have little chance restraining it (Dietz et al., 2002, p. 5). In real life, however, it does happen that actors overcome their self-interest for the benefit of the collective (Rothstein, 2001).

To promote and sustain collective action, research has found that it is beneficial if the resource system is small with well-defined boundaries (Agrawal, 2001; Ostrom, 1990; Wade, 1988), that the group set to handle the resource is small, with low degrees of anonymity; that actors share norms and expectations on future behaviour as well as a history of successful interactions – and of course that they trust each other (Agrawal, 2001; Baland & Platteau, 1996; Dietz et al., 2002; Ostrom, 1990; Wade, 1988). However, these findings stems mostly from dilemmas of relatively small scale, and many of the threats to our environment originates from mass-behaviour on an international level (Duit, 2010). Scaling up, resource systems expand and its boundaries cover larger areas, making them harder to manage. Moreover, increasing the number of actors involved inevitably makes communication harder and anonymity a problem, which increases the risk for free-riding behaviour – a behaviour where actors enjoy the benefits from a good without contributing to it (Jagers et al., 2019).

Hence, overcoming large-scale collective action problems unavoidably requires people to cooperate with people whom they know very little about. Unfortunately, sharing the risk of an imminent tragedy is not incentive enough in getting individuals to overcome their self-interest and cooperate. Fear of being exploited by others, thus risking to end up in a situation as the 'sucker'[1], make cooperation a risky strategy. In these larger scenarios, trust has also been shown to foster cooperation (De Cremer & Stouten, 2003; Hayashi et al., 1999; Parks & Hulbert, 1995; Yamagishi & Cook, 1993). However, trust in large-scale dilemmas are of a more generalized form compared to the particularized form of trust useful in dilemmas of smaller size. Generalized social trust work as a 'proxy' for the trustworthiness of others when there are no possibilities of obtaining actual information on all actors involved (Sønderskov, 2009).

The direct and positive relationship between trust and cooperation therefore implies that societies steeped with higher levels of generalized trust should display higher levels of cooperative behaviour. Yet, recent survey data from European Values Study tells another story. In line with theory, in Sweden and Finland where trust-levels are among the world's highest

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[1] A situation, or position, where an actor contribute in solving a dilemma but due to widespread free-riding behaviour among other actors the good end up being depleted anyway (see Kollock, 1998).

(Delhey & Newton, 2005; Holmberg & Rothstein, 2020), about 85 percent of the respondents hold the view that they, on an individual level, should do what they can for the environment regardless the action taken by others. However, displaying equally high cooperative tendencies are countries such as Albania and Hungary, where generalized trust-levels are found at the opposite end of the spectrum (EVS, 2019). At first glance, willingness to cooperate for the environment seem to be the same in these countries, regardless their levels of trust. The vast majority of studies on trust and large-scale collective action in solving environmental problems are carried out in contexts where general trust levels are high, both on a societal and on an individual level (Jagers & Robertson, 2018).

The findings that individuals propensity to cooperate for the environment are high even in countries where trust is low actualises the question of how trust influence cooperation. Although research suggest a strong link between generalized trust and cooperation there is reason to yet again ask the question: *How do trust influence individuals' propensity to cooperate in large-scale environmental collective action dilemmas?* With the further inquiry as to how trust-context might alter that relationship, especially motivated since the effect of trust have been found to vary greatly between countries (Fairbrother, 2016). If trust are found to only influence cooperation in high-trusting countries, the use of trust in large-scale environmental dilemmas is rather limited considering that for large parts of the world people do not generally trust each other (Fairbrother, 2016). Accordingly, the broader aim of this thesis is to further examine the role of trust in overcoming problems related to large-scale collective action. Both generalized social trust and political-institutional trust are used to study two types of collective action dilemmas – first-, and second order cooperation. Understanding whether trust facilitates cooperation regardless the context is useful if we want to tackle many of the environmental threats that are requiring cooperation to be resolved. More specifically, the purpose of the study is to investigate whether the relationship between trust and cooperation in large-scale environmental collective action dilemmas hold using a larger set of countries, and if the relationship is independent of trust-context.

As implied in Jagers and Robertson's article (2018), the relative effects of individual-level trust on cooperation might be greater in contexts where societal trust levels are low. On the other hand, Irwin and Berigan (2013) found that in collectivist cultures, where societal trust is considered low, trust is incapable of bringing cooperation about at all. Whereas in individualistic cultures, where societal levels of trust are high, trust is a significant facilitator of cooperation (Irwin & Berigan, 2013). By taking trust-context into consideration, there seems to be ambiguities both regarding trust's capacity in promoting cooperation, and the effect of

trust in said relationship. Gaining an increased understanding of how the role of trust might differ with context are relevant to the research field itself, but also for policy implications deriving from it. Policy measures relying on individual trust might result in different outcomes dependent upon in which trust-context individuals live.

After this introductory chapter follows the literature review, which serves the purpose to identify a well-motivated research gap. With support from the literature review, a theoretical framework is elaborated in chapter three, where a set of hypotheses is formulated as well. Data and operationalizations are discussed in chapter four. How to test the hypotheses are discussed in chapter five on methodology. Results are presented in chapter six, and discussed and analysed in chapter seven. Lastly, the thesis concludes.

2. LITERATURE REVIEW

This literature review examines previous research on trust and collective action. First, theories explaining how to overcome problems related to collective action are presented. In doing so, factors influencing individual propensity to cooperate for the environment is identified. Since trust is of main interest in this study a large proportion of the review is devoted to the role of trust and how trust is claimed to affect cooperation in environmental collective action dilemmas. Trust is a multi-faceted concept and it is necessary to declare as specific as possible how the concept are being used. Lastly, a research gap is identified and findings from the review are synthesized in order to lay the foundation for the theoretical framework that underlies the upcoming analysis.

2.1 Solving the dilemma

Understanding under which circumstances actors choose to cooperate, and ultimately how to resolve problems related to large-scale collective action, is important if we want to solve many of the threats facing our environment. To conceptualize the matter Jagers and colleagues (2019) developed an analytical framework that sought to bring clarity regarding how factors, or facilitators, transition when moving from small- to large-scale collective action.

Scaling up primarily alters the number of actors involved, the spatial and temporal distance, as well as the complexity of the problem (Jagers et al., 2019). In terms of pollution; compared to a small lake, an ocean have considerably many more actors contributing to the pollution, and it extends over large areas, encompassing many countries. Moreover, it might be

hard for any one single actor to directly see the harm that their own polluting activity inflicts as well as grasping all possible consequences of their detrimental behaviour. Small scale facilitators like being a conditional co-operator that cooperates under the premise that other actors also cooperate (Fischbacher et al., 2001; Gächter & Herrmann, 2009) might prove insufficient as an explanation in large-scale scenarios as it simply might be impossible to be informed on the behaviour of others. Being willing to punish free riders (Gächter & Herrmann, 2009) and accepting the associated costs of doing so (Fehr & Gächter, 2000) plays little role in large-scale scenarios where you typically are unable to identify who the free riders are.

In fact, due to certain stressors, collective action in large-scale settings are unlikely to happen. The increasing number of actors involved causes anonymity, which diminishes possibilities for face-to-face communication and the ability to successfully monitor agreements and promises between actors, thereby increasing the risk for free-riding behaviour among actors (Greif, 1993; Ostrom, 1998). On a related note, inabilities to monitor individuals' behaviour, in combination with their individual contribution being very small, results in difficulties holding individual actors accountable (Jagers et al., 2019). With scale, the increased heterogeneity among actors involved challenges the possibilities for overcoming social dilemmas and sustaining collective action. A variety among actors in terms of identities, socioeconomic status, power asymmetries, culture, traditions and religion, undermine the basis for trust, a factor considered a necessary prerequisite for cooperation (Baland & Platteau, 1996; Ostrom, 2010; Varughese & Ostrom, 2001). Furthermore, uncertainty about the actions taken by other actors when managing a resource have been shown to reduce cooperative behaviour (Rapoport et al., 1992).

Facilitators for cooperation are classified into three categories (Jagers et al., 2019). The first set of facilitators are those found on an intra-actor level where actors' individual predispositions determine the likelihood for cooperation. Individuals possessing certain pro-social preferences, values, and personal norms, are more likely to be concerned about the needs and preferences of other actors which thereby improve conditions for cooperation (Bogaert et al., 2008; Fehr & Schmidt, 1999; Fehr & Gächter, 2002; Kerr, 1995).

On the inter-actor level, factors such as communication (Balliet, 2010; Dawes et al., 1977; Dietz et al., 2002), punishment (Balliet & Van Lange, 2013; Fehr & Gächter, 2000), reciprocity (Fischbacher et al., 2001; Ostrom & Walker, 2003) and conditional cooperation (Gächter & Herrmann, 2009; Levi, 1998) are found to significantly increase chances for cooperation. Still, due to the stressors described above, the relevance of these factors in large-scale dilemmas can

be called into question since actors involved in large-scale dilemmas, like recycling, barely know about the actions taken by others (Jagers et al., 2019).

Because of the uncertainty regarding the behaviour of other actors in these types of dilemmas, actors have to determine whether to cooperate or not upon their assessments of the probable behaviour of other. Trust, however, have proven to be an important mechanism for overcoming problems originating from the uncertainty of other people's behaviour and by extension for the resolution of collective action (Cook & State, 2017; Sønderskov, 2009). If actors rely on the propensity of other actors to cooperate then cooperation is likely to increase, the argument goes (Cook et al., 2005; Cook & State, 2017; Levi & Stoker, 2000; Nannestad, 2008; Ostrom & Walker, 2003; Uslaner, 2002; Van Lange et al., 2017). Although, it should be noted that trust is not the sole driver for cooperation. Cooperation can occur in situations where trust is low, or even absent, as is the main argument driven in Cook, Hardin and Levi's *Cooperation Without Trust?* (2005). At first glance, the role of trust might seem ambiguous where it on the one hand facilitates cooperation and on the other seems unnecessary. But as will be shown, it is highly dependent upon the conceptualization of trust and how it is defined.

Finally, facilitators are also prevalent on a societal level. Social norms of cooperation affect individual behaviour (Biel & Thøgersen, 2007; Ostrom, 1998; Stern et al., 1999) and sound institutions that are able to observe and monitor, as well as sanction defective behaviour, increase the likelihood for cooperation among citizens (Baland & Platteau, 1996; Poteete & Ostrom, 2004; Tsebelis, 2002; Varughese & Ostrom, 2001). Accordingly, trust and social norms vary with context (e.g. in different countries), and in terms of state capacity and quality, there are crucial variation between as well as within countries (Charron et al., 2015). There are therefore reasonable grounds as to why willingness to cooperate should be dependent upon factors from both the individual and the contextual level.

The remainder of this chapter will focus on factors from the three categories in order to build an understanding on what shapes cooperation in large-scale environmental collective dilemmas.

2.2 Pro-environmental behaviours

As the term implies, factors found on an intra-actor level has to do with individual personality traits facilitating cooperative tendencies, or more generally in this context, pro-environmental behaviours (PEB). Pro-environmental behaviour is a "behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world"

(Kollmuss & Agyeman, 2002, p. 240). Recycling, buying 'eco-friendly' products, reducing energy usage are voluntary personal efforts that have the possibility of reducing the negative impact on the environment. Although more of an indirect approach, paying taxes or donating money to environmental charities and funds are also considered actions for reducing one's negative impact. A pro-environmental behaviour is not necessarily equal to cooperation in a collective action dilemma, but considering that a lot of research on collective action use PEB's as outcome variables justifies the inclusion of PEB-research in this review. Research on PEB aim to understand how individuals can move from having knowledge about threats to the environment and an awareness of environmental concerns, into performing benevolent actions positive for to the environment (Kollmuss & Agyeman, 2002).

Research has come up with several ways of making pro-environmental behaviour intelligible. Early models suggested that knowledge about the environment would increase concern and awareness which would lead to pro-environmental behaviours. Despite its simplicity, such models proved insufficient, and information and awareness in isolation seldom lead to changes in behaviour (Kollmuss & Agyeman, 2002). However, it served as a starting point for further development.

Presumably the most frequently used method for explaining PEB is Ajzen's (1991) 'theory of planned behaviour' (TPB) (Yuriev et al., 2020). Compared to earlier models, the main contribution of TPB is that it acknowledges that attitudes do not change behaviour directly. Attitudes change behaviour indirectly through their ability to influence intentions (Kollmuss & Agyeman, 2002). Intra-level factors such as information, awareness about the threats facing the environment, and locus of control shape attitudes and are consequently capable of altering intentions to cooperate for the environment. It should be added that underlying the formation of attitudes is the evaluative belief of consequences of one's behaviour (Ajzen & Fishbein, 1980). Holding the position that one's own actions are inconsequential reduces the likelihood for behaving pro-environmentally.

However, intentions are not solely influenced by attitudes. Individuals' normative beliefs about how other individuals will perceive one's action, and if the individual want to act in accordance with those views, creates a subjective norm that, in addition with the attitude held toward the behaviour, influence behavioural intention (Ajzen & Fishbein, 1980).

The ambition is not to give a comprehensive account of the literature on pro-environmental behaviour, but rather to use it as a point of departure for understanding what shapes willingness to cooperate, and pro-environmental behaviours more generally. As such, the approach taken in this thesis goes in line with the reasoning of Kollmuss and Agyeman

(2002) that "see environmental knowledge, values, and attitudes, together with emotional involvement as making up a complex we call 'pro-environmental consciousness'," which is "embedded in broader personal values and shaped by personality traits and other internal as well as external factors." (Kollmuss & Agyeman, 2002, p. 256). Adopting this approach renders the possibility to include factors from the research field on PEB into the theoretical framework on environmental cooperation. More specifically, the intra-level factors that will be used are awareness about the threats facing the environment and locus of control, political ideology, as well as demographic factors.

2.3 The role of trust

Found on the inter-actor level, trust is generally considered to positively influence the outcome of any collaboration and promotes resolutions of social dilemmas (Cook & State, 2017). However, it should be noted that trust is also considered a societal feature. On a societal level trust is considered to be either the direct cause or to be a necessary prerequisite for what is generally appreciated in society (Nannestad, 2008). Trust is positively linked to economic development and growth (Putnam, 1993; Uslaner, 2002). Trust affect governmental performance (Knack, 2002) and the functioning of the welfare state (Rothstein, 2001), and societies permeated with trusting people exhibit lower levels of crime and corruption (Rothstein & Uslaner, 2005). Regardless all the positive outcomes attributed to the role of trust, there is yet to this day no clear-cut theory on trust, and conceptualizations of trust take many forms (Delhey & Newton, 2005). In an attempt to disentangle the aspect of interpersonal trust, Peter Nannestad reviews the different strands of the concept and identifies two dimensions along which interpersonal trust can be classified (Nannestad, 2008). Along the first dimension the concept is treated as being either rational or norm-driven. The rational view of the concept goes much in line with Cook, Hardin, and Levi's definition of trust as an 'encapsulated interest': "we trust you because we think you take our interests to heart and encapsulate our interests in your own" (Cook et al., 2005, p. 5). At the other extreme, trust is explained as norm-driven and agrees well with Eric Uslaner's view of trust as "a general outlook on human nature" (Uslaner, 2002, p. 17) where trust is achieved by socialization processes rather than through rational utility maximizing, as in the case of 'encapsulated interest'.

Along the second dimension, trust is moving from particularized to generalized. At the particularized extreme, trust can only be established between two individuals and tangents the approach of trust as 'encapsulated interest', where you need to have sufficient information on

the other part and that trust only extends to specific situations. At the other end, where trust is considered something that can be generalized, it follows that it is fully possible to trust strangers you know very little about, and that trust are thought to be useful even in unspecified situations. The particularized approach of trust can be expressed with a scenario where actor A trusts actor B in a given situation X, whereas the generalized view rather holds that trust is to be thought of as a trait that actor A possess, and that other actors, in general, can be trusted, regardless the situation (Nannestad, 2008).

Considering that two widely accepted conceptualizations of trust exist simultaneously explains why Putnam (1993) on the one hand and Cook, Hardin, and Levi (2005) on the other reaches such stark contrasting conclusions. As developed by Putnam (1993), the social capital theory encompasses the generalized definition of trust. Generalized trust, together with other virtues such as shared norms of behaviour and participation in formal and informal networks make up what is referred to as social capital. Putnam maintains that social capital is crucial for explaining the performance of societies and points to the distinct regional differences between the relatively well-functioning northern parts of Italy where social capital is prevalent, whereas lack of social capital in southern Italy renders dysfunctional societies (Putnam, 1993). Cook, Hardin and Levi, with their theory of trust as an 'encapsulated interest', withholds that "[t]rust is important in many interpersonal contexts, but it cannot carry the weight of making complex societies function productively and effectively." (Cook et al., 2005, p. 1).

For trust to be a meaningful concept explaining cooperation in large-scale collective action settings, it is necessary to apply the broader, generalized, definition of trust. Using a narrow definition of trust, one which is only applicable in situations between specific actors and with respect to specific issues is simply not useful in situations dealing with global issues (e.g. pollution) which by design are characterized by widespread anonymity and poor communication opportunities. Cook, Hardin and Levi go so far as to say that "it is impossible by our definition to trust strangers and even many of our acquaintances, and it is virtually impossible by our definition to trust institutions, governments, or other large collectivities." (Cook et al., 2005, p. 4-5). Thus, the links between generalized social trust, political-institutional trust and cooperation that have been identified in previous research should be spurious at best.

However, many researchers argue otherwise. People whom are generally more trustful are also more prone to think of other peoples' intentions in a positive way, causing them to establish pro-social behaviours which enables cooperation and in the end the generation of positive externalities for society (Stolle, 2001). Regarding the relevance of generalized trust for

cooperation in large-scale dilemmas, Rothstein (2005) and Nannestad (2006) argues that the scale of the dilemma is of little importance and that the mechanisms at work in small-scale scenarios apply in large-scale dilemmas as well. Trusting that most other people cooperate reduces the risk for any actor ending up as the sucker if they cooperate, therefore it is safe to cooperate, they argue. Sønderskov (2009) questions this, maintaining that it still does not give an account as to why actors choose to cooperate if they assume that most people in general cooperate, since incentives to free-ride in such contexts should be high. Pointing to evidence from evolutionary psychology and experimental economics, Sønderskov (2009) makes an assumption that people, in general, are conditional co-operators. That is, an actor cooperate if others cooperate.

But how do these theories fare in practice? Findings from experimental public goods games (Fischbacher et al., 2001) show that about a third are free-riders and fifty percent are conditional co-operators, giving some support for both views. However, it should be noted that contributions are expected to 'spiral downwards' over time. Albeit contributions remaining positive, when people through repeated interactions learn that other people free-ride they are inclined to make smaller contributions (Fischbacher et al., 2001). Conversely, Fairbrother (2016), points to a 'virtuous circle' where compliance leads to yet higher levels of cooperation through self-reinforcing mechanisms of reciprocity, which could help to explain why trust may be of relative importance between countries.

For political-institutional trust to also be a useful concept, it needs to be thought of as a generalized form of trust as well. Trust in politicians and institutions reflect institutional quality (Duit, 2010; Fairbrother, 2016). If individuals have confidence in and trust that politicians and institutions are capable of coercing other individuals into compliance, and in their capabilities to properly manage the resource they are set to handle, they are more inclined to comply themselves.

The discussion on trust and cooperation now narrows down to the two specific aspects of trust that is relevant for the present study, that is generalized social trust and political-institutional trust.

2.3.1 Social trust and cooperation

The literature on social dilemmas generally consider generalized social trust to be positively linked to cooperation (Irwin & Berigan, 2013; Sønderskov, 2009). Generalized social trust, compared to a more narrow definition, is particularly well suited for dilemmas of large scale, since it holds on a theoretical level. The 'encapsulated trust' definition do not allow

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people to trust people in general (Cook et al., 2005), thus rendering it irrelevant in large scale dilemmas in which stressors such as anonymity and poor communication are prevalent (Jagers et al., 2019).

Different mechanisms are proposed linking generalized social trust to cooperation. Irwin and Berigan (2013) highlights that trusting individuals tend to believe others to have benign intentions which thus renders trusting individuals to cooperate since they believe that their contribution will be reciprocated. Furthermore, due to trusting individuals' benevolent outlook on others, fear of exploitation will not prevent them from contributing since they expect others to contribute as well; contributing is thus perceived as a good investment (Irwin & Berigan, 2013). Sønderskov argues that generalized social trust works as "a stereotypic perception of other people" (2009, p. 147) and tests the hypothesis that "people holding generalized social trust are—all else being equal—more inclined to cooperate in large-N collective action dilemmas because they expect others to do the same" (Sønderskov, 2009, p. 147) finding that the link between trust and cooperation is both positive and robust.

Through these mechanisms, generalized social trust is found to increase individual support for environmental protection and the mitigation of climate change (Fairbrother, 2016; Gür, 2020), and their willingness to pay for the environment (Jones et al., 2009); increased individual cooperation in both voluntary and regulated collective action situations (Irwin, 2019). Trusting individuals are also more prone to recycle (Harring et al., 2019).

2.3.2 Political-institutional trust and cooperation

Many collective action problems take the form of second-order dilemmas. Solving first-order dilemmas often involves implementing a third-party institution in order to manage the good and monitor behaviour (Mansbridge, 2014; Olson, 1965). However, that institution (e.g. the UN or a national government), is at the same time also a public good subject to the same problems associated with collective action dilemmas since it raises doubts regarding its capacity to impartially, and sufficiently enough, coerce and monitor itself (Knack, 2002). For individuals to comply with the regulations imposed upon them therefore amounts to whether individuals trust their politicians and public institutions. Furthermore, it is not self-evident that social trust should be equally important in second-order dilemmas as they are in dilemmas of first order. Whereas in some scenarios, like recycling, both aspects of trust are necessary for it to function. On a theoretically level, trusting that other people recycle their waste should increase individual likelihood for cooperation. Recycling is probably also contingent upon whether individuals trust that the institutions set to take care of the garbage disposal in turn actually recycles the

waste in a responsible and appropriate way. Confirming this, Harring and colleagues (2019) find that both generalized social trust and political-institutional trust are positively linked to self-reported recycling behaviour.

Research suggests that, compared to social trust, the link between political-institutional trust on cooperation are somewhat more ambiguous. It is quite reasonable to assume that individuals do not necessarily trust all political institutions and all parts of the public sector as distrust in one branch often spill over to other areas (Cook et al., 2005, p. 79), and individuals might be selective as to which issues they trust political institutions to be capable of managing (Harring, 2013).

Regardless, empirical research has shown that trust in political institutions (e.g. politicians, parliament, government) are positively linked to increased support for climate policies and environmental protection (Drews & van den Bergh, 2016; Fairbrother, 2016). Harring (2013) finds that even after controlling for corruption, which is theoretically closely related to the concept of political-institutional trust, people trusting politicians are in general more willing to pay for the environment. To nuance the results, Irwin (2009) finds that institutional trust only promote cooperation and pro-environmental behaviours in scenarios where commitments are relatively cheap and easy. Thus, while political-institutional trust seem to increase individuals propensity to engage in activities such as paying for the environment, it may do so only up to a certain point.

Duit (2010), on the other hand, finds inconsistent results from institutional trust on cooperation in large-scale environmental collective action. Even though distinguishing between coordinated (e.g. contributing to an environmental organisation) and uncoordinated (e.g. reducing one's water consumption) collective action, Duit is unable to find previous researchers' seemingly robust findings of a strong and positive link between institutional trust and cooperation. Parts of these findings are probably due to operationalisations. The collective action indices, for example, are made up by survey items asking the respondent about whether they, for environmental reasons, considered reusing or recycling something instead of throwing it away; or if they have ever attended a meeting or signed a petition aimed at protecting the environment. Finding that institutional trust (as in confidence in the civil service or the police) display a weak relationship with signing petitions should not be surprising since the theoretical link between the two is not clear-cut.

2.3.3 Short note on social trust and political-institutional trust

Explaining the origins of trust or the varying levels of trust between countries (see Delhey & Newton, 2005; Nannestad, 2008) is beyond the scope of this thesis. However, it is appropriate to include a short note on the relation between social and political-institutional trust since both concepts are included in the theoretical framework.

Rothstein and Stolle (2008) theorize that institutional quality cause social trust. Procedural fairness and impartial institutions lead citizens to be more trusting in the institutions that govern them since they can predict the behaviour of officials and judges, etc. This in turn influence the way citizens perceive their own safety and protection. By experiencing that other people also act under the same conditions and are being treated equally creates breeding grounds for social trust to evolve (Rothstein & Stolle, 2008).

A Danish study addressed this issue and disentangled the question regarding causality between social and political-institutional trust and asked whether social trust cause political-institutional trust or vice versa, or whether both forms of trust rather reflects some deep-rooted disposition. By measuring the same participants for as long as 18 years, results from panel analyses led them to strongly affirm that political-institutional trust cause social trust (Sønderskov & Dinesen, 2016). Denmark are among the top performers in terms of both social and political-institutional trust, and it is therefore not necessarily the case that these results hold in contexts where trust is low. Other findings also suggest that individuals with high levels of social trust moving to countries where institutional quality is low retain their high levels of social trust, indicating that institutional quality does not cause already trusting individuals into being less trusting (Bergh & Öhrvall, 2018).

2.4 Trust-context

The ending section of this literature review discusses how the societal level, or context, might affect willingness to cooperate. On a societal level, generalized trust levels show great variation where some measures show that for some countries about 70 percent state that people in general can be trusted whereas for some countries the same number is down to almost 0 percent (Nannestad, 2008). Research suggests that societal trust levels are partly explained by race, age and education (Irwin & Berigan, 2013), where high trust countries often have in common that they are ethnically and linguistically homogeneous, Protestant, rich and with low income inequality and high quality of government (Delhey & Newton, 2005).

Social norms and cultural traditions also influence cooperation. Since norms and traditions varies at country level and are generally reflecting those held by the dominant culture (Kollmuss & Agyeman, 2002), it is probable that some countries will have rather strong norms of cooperation whereas others will not. Regardless individual levels of trust, if there are no societal norms of cooperation, chances are that it will affect their willingness to cooperate negatively. This reasoning taps into the thinking of Elinor Ostrom, as summarized in Jagers and colleagues (2019): links between trust, reciprocity and reputation form the basis for cooperation in collective action dilemmas. Reciprocity norms are more prevalent in countries where citizens are used to cooperate, leading to a desire among individuals to be perceived as trustworthy. Due to the interconnectedness between these factors they can be understood as being part of a virtuous circle (Fairbrother, 2016; Jagers et al., 2019) where they help to mutually reinforce each other. The same mechanisms can of course explain the opposite outcome as well. If actors, based on previous experiences, do not expect that other actors will cooperate, they might choose to abstain from cooperation (Jagers et al., 2019). Previous studies have failed to adequately account for the impact that context might have on the trust-cooperation relationship.

Hence, does it matter for cooperation whether you live in a high-trusting or low-trusting country? Actualized by findings showing that the effect of trust on predicting support for environmental protection varies greatly between countries (Fairbrother, 2016) there is reason to investigate whether this applies to the relationship between trust and environmental cooperation in general as well. Especially since many studies that found trust to be a significant explanation to cooperation are carried out in contexts where trust is high (Irwin & Berigan, 2013; Jagers & Robertson, 2018).

Does the relationship hold in contexts where distrust is widespread among its citizens? The rationale is that in order for cooperation and compliance with rules to occur, individuals have to trust that other individuals, as well as politicians and authorities, also comply (Fairbrother, 2016). Perhaps somewhat exaggerated, if people do not trust that other actors will comply it is unlikely that they themselves will choose to play by the rules and cooperate, at least when compared to a context where the majority consider other people trustworthy. An article tested this hypothesis and concluded that for recycling and consumption of organic food, it holds; in countries where generalized social trust is higher the amount of recycling and organic food consumption is comparatively higher (Sønderskov, 2009).

Perhaps the most well-reputed theory of trust and context is that of Toshio Yamagishi (Yamagishi, 2017; Yamagishi et al., 1998; Yamagishi & Yamagishi, 1994). In short, the theory asserts that collectivist societies have strong bonds between in-group members, fostering self-

monitoring and in-group sanctioning. Thus, for collectivist societies, in-group trust is high while trust on a societal level is low. Whereas in individualistic societies people do not have the same type of group affiliations and out of necessity their trust radius are wider since they have to trust its co-citizens more generally in order to cooperate. Similar to the present study, Irwin and Berigan (2013) tests whether these cultural differences affects the relationship between trust and willingness to engage in cooperation for the environment. They hypothesize that trust is an insufficient explanation for cooperation in collectivist societies, while in high-trusting individualistic societies trust is a strong predictor for cooperation. They distinguish between two aspects of cooperation through two items: how willing individuals are to i) cut living standards, and ii) pay much higher taxes, in order to protect the environment. By gaining support for their hypotheses, their results indicate an interplay between culture and trust in predicting cooperation.

2.5 Aim of the study

The effect of trust on cooperation in large-scale collective action dilemmas needs to be further investigated. If we are to improve chances for solving many of our most pressing threats facing the environment it is necessary to understand how cooperation best can be facilitated. Since societal levels of trust differ substantially across countries there is reason to believe that the relationship between individual-level social trust, political-institutional trust, and cooperation, might differ between countries. The lion's share of previous research have studied the link mostly in contexts where trust on a societal level is high (Jagers & Robertson, 2018). Even though Irwin and Berigan (2013) tried to bring in context as a mediator, they were mostly interested in differences between collectivistic and individualistic societies and did so by looking specifically at the US. Even if trust varies across states in the US, they are all subset to the same federal laws and institutions. To better understand the role of trust in fostering cooperation in large-scale environmental collective action dilemmas, ultimately spanning the whole globe, there is a need to better understand how individual-level trust affects cooperation for the environment using a wider set of countries that, in terms of trust, varies more.

Furthermore, most literature measure collective action through different pro-environmental behaviours, like recycling and membership in environmental groups (Irwin, 2019). While they most certainly are collective action dilemmas, it is not necessarily the case that respondents' perceive them as such. Using items that better touches upon the very logic of collective action dilemmas should pave the way for a deeper understanding of how trust influence cooperation in large-scale collective action dilemmas. As such, the present study is

an empirical contribution to the ongoing research on how factors proven benevolent in small-scale collective action dilemmas travel to large-scale dilemmas.

3. THEORETICAL FRAMEWORK

In the previous literature review it was concluded that factors influencing individuals propensities to cooperate in solving large-scale environmental collective action dilemmas are situated at three different levels. It is necessary to include these factors in order to better isolate the unique effect that trust has on cooperation. Intra-level factors are found "within" individuals; it is what constitute individuals in terms of personality traits, environmental attitudes, and demographic factors. Of special interest for this study is the role of trust. Trust is found at the inter-actor level: between individuals, as well as between individuals and institutions. Furthermore, considering the large variation of trust on the societal level there is reason to believe that the choice individuals make to cooperate to some extent will be influenced by the context in which they are nested.

Following the rationale of Irwin and Berigan (2013) and Irwin (2019), I distinguish between first-order and second-order cooperation. First-order cooperation refers to contributions aimed directly to the collective effort, for example reducing one's carbon footprint by riding the bike instead of taking the car, or turning down the thermostat. Second-order cooperation is an indirect way of contributing and refers to situations where there are intermediaries between the contributing individual and the actual collective effort. The need for an intermediary, typically the state, arise because individuals often are incapable of satisfactorily reaching the desired outcome on their own. For individuals to take part in second-order cooperation often necessitates that they trust the institutions set to handle the task (Jagers & Robertson, 2018). Paying environmental taxes involves a paying individual, but also an institution responsible for collecting the tax and turning it into a joint environmental action. Or, as discussed, if individuals do not trust the institutions taking care of waste management to function properly they will probably be less inclined to recycle. In these types of scenarios social trust may not be the only relevant aspect of trust. It is therefore necessary to distinguish between on the one hand social trust and on the other political-institutional trust when examining second-order cooperation.

## 3.1 Relationship between trust and cooperation

For first-order cooperation to occur in large-scale environmental collective action dilemmas individuals have to act without knowing how other individuals will act. Due to inherent risks of free-riding behaviour in large scale dilemmas there is reason to believe that other people might put their own self-interest before the interest of the collective. Individuals may want to contribute to protect the environment but are hampered by the fact that they cannot do it themselves, concluding that the desired outcome only is reached through joint efforts (Connelly et al., 2012, p. 143-4). As discussed, in large-scale collective action dilemmas, generalized social trust can help to promote cooperation when individuals have no possibilities of monitoring the behaviour of others (Gür, 2020; Irwin & Berigan, 2013; Nannestad, 2008; Sønderskov, 2009), and explain why cooperation occur even in the absence of third-party enforcement. Therefore, all else equal, in countries where citizens generally trust each other, cooperation should be more common compared to countries where distrust is widespread among its citizens.

Hypothesis 1 states that individuals believing in the trustworthiness of others are more inclined to join in on any first-order cooperation since they trust that others will do the same. Through expected reciprocity, the risks involved with joining in on any first-order cooperation will be perceived as lower. For second-order cooperation there is reason to believe that individuals who generally trust other people might hold the opinion that second-order solutions are unnecessary since they are inclined to cooperate anyways, and expect others to do so as well. Because of the expected reciprocity among trusting individuals, **hypothesis 2** states that generalized social trust will exhibit a positive relationship even in second-order cooperation. After all, if people trust that other people pay their taxes – a second-order situation – it will be more meaningful for themselves to do so as well.

As discussed, analysing second-order cooperation requires the concepts of social trust and political-institutional trust to be distinguished. While social trust is still relevant, it is also necessary for individuals to have confidence in the political-institutional system, whose task it is to manage each individual's contribution. Without such confidence individuals are less inclined to cooperate. It is simply no idea to contribute if you believe that the institutions implemented are incapable of efficiently reaching the intended purpose or that they are unable to enforce other individuals into cooperation. Therefore, **hypothesis 3** states that the more individuals trust the political-institutional system, the more they are inclined to join in on second-order cooperation.

The link between political-institutional trust and first-order cooperation is not straightforward. At first glance it may seem farfetched that political-institutional trust should have an impact on individuals' propensity to enter into first-order cooperation. However, considering the discussion regarding causality between political-institutional and social trust it is probable that political-institutional trust is an antecedent factor affecting individuals' social trust levels. In that way, it is possible that political-institutional trust has an effect on first-order cooperation, but through its impact that it has on social trust. By putting the causality debate aside, and for the sake of this framework, **hypothesis 4** states that political-institutional trust has no correlation with first-order cooperation.

Figure 3.1.   Hypothesized relationship between trust-context, generalized social trust, political-institutional trust, and cooperation.
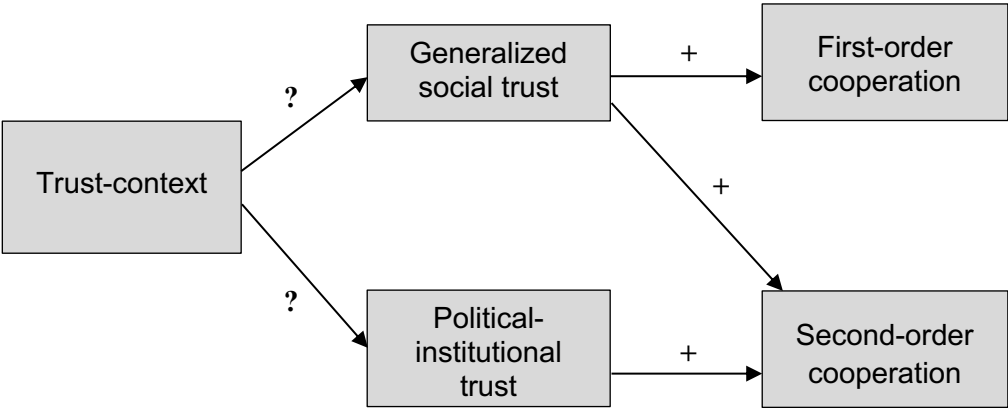
3.2 Exploring the role of trust-context

Due to the varying levels of trust between countries (Fairbrother, 2016; Nannestad, 2008) and the fact that most studies on trust are carried out in high-trust countries, this thesis is also set to explore whether trust-context affect the relationship between trust and cooperation. To understand this requires the concept of trust to be broadened. According to scholars like Putnam (1993), social trust can be understood as being a part of the wider concept of social capital and should be thought of as a societal feature rather than a personality trait, where societies rich in social capital enjoy higher levels of cooperation compared to societies where social capital is low. On the other hand, trust is a personality trait, or a characteristic that individuals have – some individuals trust other people in general whereas others do not. Thus, the combination of trust as a societal feature and trust on an individual level opens up for the possibility that the role of trust might play out differently depending on context. Especially since it is generally

agreed upon that in order for trust to have its benevolent effect on cooperation, individuals have to trust other individuals to quite a large extent (Ostrom, 2010). Although only an exploration, the prediction is that in countries where societal trust levels are low, individual levels of trust might only marginally increase individuals' propensity to cooperate for the environment, if at all.

3.3 Towards a more comprehensive model

Even though trust is of principal interest, trust only accounts for marginal explanations to cooperation. People may choose to cooperate for the environment out of entirely different reasons than those discussed in this theoretical framework (e.g. out of altruism, to feel better about oneself). The ambition is not to give a full account on what creates individuals' cooperative predispositions. Still, it is necessary to expand the framework to better be able to isolate the unique effect that trust has on cooperation.

If people are aware of the seriousness of the threats facing the environment, and if they think that it is within their capacity to do something about it, are important to consider in a model explaining cooperation. Demographic factors such as age, sex, income, and education; as well as state capacity and economic development on a societal level, also help to explain parts of the cooperative tendencies found within people and are thus embodied into the framework. How these factors are hypothesized to influence cooperation are covered under the following chapter on operationalizations.

Figure 3.2.   Factors included in the theoretical model.
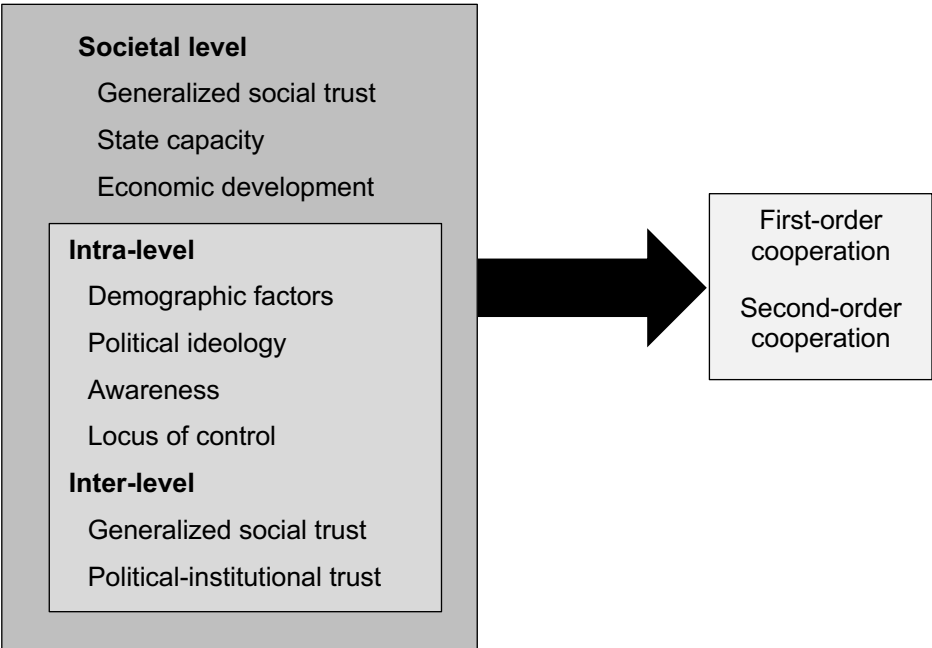
4. DATA AND OPERATIONALIZATIONS

4.1 Data

Individual level data are collected from the fifth wave of the European Values Study (EVS). EVS has conducted surveys through 1981 to 2017 with the focus of covering individuals' attitudes, beliefs, and values concerning a variety of topics, where the environment is one among them (EVS, 2019). The recommended fieldwork period for the fifth wave were between September 2017 and December 2017, although several countries submitted their responses as late as late summer 2018. The data cover 30 European countries and compared to other datasets it includes a relatively large share of the Eastern European countries[2]. Interviews were carried out in each country in their native languages using either a traditional paper and pen method (PAPI) or computer assisted techniques (CAPI). Despite large variances in response rate among countries (from 25 to 87 percent), the survey includes 56,368 respondents selected through random sampling, resulting in an average of 1879 respondents per country (EVS, 2019)[3].

Data on the country level variable of economic development are gathered from the World Bank's World Development Indicators[4] provided in the QoG Standard Dataset 2020[5]. Data on state capacity is also collected from the QoG dataset. Data on trust-context are country averages of individuals' social trust scores and are thus based on aggregates of the individual data found in the EVS dataset.

4.2 Operationalizations

4.2.1 Dependent variables

In order to operationalize the two aspects of collective action dilemmas, two items are used as dependent variables. The EVS-survey asks respondents on a five-level Likert scale how much they agree or disagree with a set of environmental statements, where 1 is 'agree strongly', 2 'agree', 3 'neither agree nor disagree', 4 'disagree', and 5 'disagree strongly'.

The concept of first-order cooperation is covered through the item: "[*t*]*here is no point in doing what I can for the environment unless others do the same.*" The second item is intended

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[2] See Appendix A for a full list of participating countries.
[3] For a full methodological review visit https://europeanvaluesstudy.eu/methodology-data-documentation/evs-methodology/
[4] http://datatopics.worldbank.org/world-development-indicators/
[5] https://qog.pol.gu.se/data

to capture second-order cooperation, and is stated as: "*I would give part of my income if I were certain that the money would be used to prevent environmental pollution.*"

What separates the two is that the first one taps into respondents' general attitudes toward cooperating to save the environment. The respondents are thus free to interpret it as any pro-environmental behaviour, but the point is that it is contingent upon their assessment of other individuals' behaviour. Following the rationale of this thesis, if individuals believe people in general to be trustworthy, they will also have a more positive outlook on the likelihood that others will cooperate, thus, they themselves will be more inclined to do what they can as well. That is, they disagree to the statement to a greater extent.

The second item differ in that it measure respondents' willingness to indirectly contribute to the cause by paying institutions whose function is to protect the environment. The likelihood for any one individual to cooperate is to some extent dependent upon their trust in others propensity to contribute, as well as in the institutions set to take care of the contributions. The second-order item is reversed so that higher values indicate a higher willingness to pay for the environment.

Both items taps into the logic of collective action dilemmas since respondents ought to know that their own contributions are infinitesimal, and that in order to achieve a noticeable outcome they are dependent upon mass-contributions by other people.

4.2.2 Independent variables

In line with previous research, *generalized social trust* is measured with a survey item asking respondents: "generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" where respondents are given the response categories "most people can be trusted" and "cannot be too careful". That the measurement is dichotomous is unfortunately a drawback since it prevents distinctions being made between e.g. high and moderate trusting people. Thus, respondents are either trusting other people in general, or they do not. While an ordinal measurement might be preferable, which would enable distinctions between trusting peoples to be made, it is not straightforward what it would actually mean if individuals describe themselves as a '7' or an '8' since substantial differences across the scale are not uniform. Especially not when considering the criticism directed at the measurement itself.

According to Nannestad the greatest weakness of the item is that it is subject to respondents' own interpretations, which could lead to implications in terms of validity. If respondents interpret wording differently it jeopardizes comparisons across individuals,

countries and time (Nannestad, 2008). As an example, Cook, Hardin and Levi mention that the words "most people" might have a different meaning today compared to what it had 40 or 50 years ago. Today, larger shares of the population lives in urban areas, and due to increased immigration, "most people" refers to both larger and more diverse groups of people, they argue (Cook et al., 2005, p. 14). Another view is given by Uslaner who argues that it rather reflects respondents moral compasses and their outlooks on life in general (Uslaner, 2002).

In total, using a dichotomous variable might be a way to avoid much of the conceptual criticism since it at least enables distinctions to be made between trusting and non-trusting individuals, regardless their interpretation. Finally, this thesis is a contribution to the ongoing empirical research on trust and collective action, and as such, it is justified to facilitate comparisons by using similar measurements.

Following "standard operating procedure" (see for example Duit, 2010; Harring, 2013; Jagers & Robertson, 2018; Sønderskov & Dinesen, 2016; Turper & Aarts, 2017), *political-institutional trust* is measured through an index. The index consists of six items asking the respondents about their confidence in i) the parliament, ii) the government, iii) the political parties, iv) the civil service, v) the justice system, and vi) the police. Response options ranges from one, "a great deal", to four, "none at all", and are reversed so that higher values indicate more trust in the political-institutional system.

Often *political trust* and *institutional trust* are kept as two separate concepts where research in the US tend to focus on trust in political institutions, most often the government. Research done outside the US usually applies a broader perspective, including both legislative/executive branches and parts of the public sector (Sønderskov & Dinesen, 2016).

Research suggests that trust in representative institutions (e.g. parliament and government) form a one-dimensional construct (Turper & Aarts, 2017). Including additional measures of both political and institutional trust into the same index might therefore lead to questions regarding validity. A principal-component factor analysis was run to test the consistency of the items. In fact, the only factor identified with an eigenvalue over 1 included all six items. With an eigenvalue of 3.48 and explaining 58 percent of the variance, the six items combined clearly measures the same underlying dimension. Testing the internal consistency of the measure, a test of Cronbach's alpha revealed a coefficient of 0.85, thus surpassing the recommended lower threshold of 0.7 (Mehmetoglu, 2017, p. 282). Furthermore, from a theoretical standpoint the dependent variables used in this study allow for a more general interpretation of political and institutional trust to be used since they are not directly concerning

any specific parts of the political sphere or the public sector. Rather, the aim is to capture individuals' general trust in the political-institutional system as a whole.

As discussed, *trust-context* is operationalized by aggregating trust-scores for each country. The lowest score are found in Albania, where 2.5 percent of the population hold the view that people in general can be trusted, at the other end is Denmark where 77.4 percent trust people in general.

4.2.3 Control variables

Stemming from pro-environmental behaviour research, *awareness* and *locus of control* are included to account for intra-level determinants. Being aware of the threats facing our environment should potentially lead to a greater willingness among individuals to work together to mitigate the threats (Fairbrother, 2016). Accordingly, if individuals perceive that the threats are not serious enough, why should they be willing to make sacrifices to take action against it? Furthermore, if individuals believe that it is beyond their personal capacity to do anything to mitigate environmental degradation, that it is up to someone else to do it, they should also be less inclined to enter into any cooperation.

Awareness is measured through an EVS-item asking the respondent on a five-level scale how much they agree or disagree with the statement "many of the claims about environmental threats are exaggerated". The more individuals are disagreeing to the statement the more "aware" they are of the threats facing our environment. Using the same scale, *locus of control* are captured with the statement "it is just too difficult for someone like me to do much about the environment". The hypothesized relationship is negative, meaning that the more individuals agree to the statement the lower their willingness to cooperate for the environment. Both awareness and locus of control are treated as continuous variables.

It is often assumed that *political ideology* is correlated with environmental attitudes and that people to the left tend show stronger pro-environmental attitudes (Fairbrother, 2016). While it may be true for some countries, results show that it is a left-right issue in some countries while the opposite holds in other countries (Fairbrother, 2016; Pisano & Lubell, 2017). Among suggested explanations is that the previous strong relationship between political ideology and environmental attitudes primarily are driven by findings from contexts characterized with great political divides on environmental issues (like the US), and that findings show the strong association between parties left-of-centre and environmental issues to be true only in Anglo-Saxon countries (Fairbrother, 2016). Considering the country sample studied (i.e. large share of non-Anglo-Saxon countries) it is expected that political ideology

might exhibit mixed results. Political ideology is measured through respondents' self-placement along a 10-point left-right scale, where one is 'left' and ten is 'right'.

State capacity is included as a second-level variable in the analyses because of its theoretical links to trust (Rothstein & Stolle, 2008). It is measured with the PRS Group's ICRG index, consisting of three components: corruption, law and order; and bureaucracy. The index, collected from the QoG Standard Dataset 2020 (Teorell et al., 2020), ranges from 0 to 1 where low scores indicate inefficient and corrupt institutions, whereas high scores indicates an impartial and well-functioning state apparatus. It is often argued that corruption diminishes prospects for cooperation (Harring, 2013) and that well-functioning states "enhances the sense of security, promotes cooperation, and evokes a willingness to take risks even among strangers or relative strangers." (Cook et al., 2005, p. 155). State capacity should therefore be positively linked to both first- and second-order cooperation.

Economic development is commonly linked to pro-environmental behaviours through two theories: Inglehart's theory on post-material values and the affluence hypothesis (Harring, 2013). Inglehart posited that the generations growing up in the relatively secure and rich societies emerging after World War II could afford to prioritize other values than what the pre-war generations could (Inglehart, 1977), implying that individuals and societies with such post-materialistic values are more prone to protect the environment. Somewhat similar to the post-material hypothesis, the affluence hypothesis states that environmental protection is a good that becomes increasingly demanded as individuals and societies get richer (Harring, 2013). That is, richer countries, as well as relatively more affluent individuals within countries, will demand more environmental protection and are thus more willing to cooperate for the environment.

Included in the analyses are both *country-level economic development* and *household income*. Economic development are measured with country-level GDP/Capita and for the sake of causality it is recommended that country-level variables are from time-points prior to the survey's fieldwork period (Mehmetoglu, 2017, p. 206). GDP/Capita (constant 2010 US-dollar) data are thus from the period 2014-2016 as found in the QoG Standard Dataset 2020 (Teorell et al., 2020). The variable is divided by 1000 in order to obtain more apprehensible coefficients, as well as log-transformed to make it better align with a normal distribution. Household income are based on respondents' self-reported annual income which then determined their relative placement in the income distribution. The scale is from 1-10 meaning that a respondent with a score of "1" corresponds to the 1st decile of the income distribution, and so on. Unfortunately, the variable does not account for household size meaning that it potentially could lead to bias where single households systematically are classified as poorer than households with two, or

more, family members. On the other hand, larger households have greater expenses, eventually offsetting some bias. All in all, it is expected that households belonging to higher income categories will be more inclined to cooperate since they have, in material terms, more resources.

Other demographic factors included are education, age and sex. Education are linked both to higher levels of generalized trust (Frederiksen et al., 2016) and a higher propensity to engage in pro-environmental behaviours (Hines et al., 1987). Age and sex are also found to be linked to pro-environmental behaviours. Young females are more likely to engage in pro-environmental behaviours compared to older males, although the relationship is weak and sometimes insignificant (Hines et al., 1987). Education are coded into four categories where "0" indicates a highest educational level of primary school, "1" secondary school and non-tertiary post-secondary, "2" university and "3" doctoral level or above, and are referred to as low, medium-low, medium-high, and high. Age is categorized into three intervals: 15-29, 30-49, and 50 or above. Sex is a dummy where "1" indicates the respondent being female.

Table 4.1.   Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
First-order cooperation	3.38	1.21	1	5
Second-order cooperation	3.35	1.17	1	5
Social trust	0.40	0.49	0	1
Political-institutional trust	2.36	0.62	1	4
Awareness	3.44	1.14	1	5
Locus of control	3.23	1.17	1	5
Political ideology	5.43	2.27	1	10
State capacity	0.72	0.21	0.333	0.972
GDP/Capita (log)	3.14	0.94	1.37	4.51
Household income	5.07	2.75	1	10
Education	1.23	0.55	0	3
Age	2.34	0.74	1	3
Sex	0.55	0.50	0	1

4.3 Limitations

Even though the ambition is to generalize findings to as many contexts as possible the ability to do so is curtailed by the fact that the items used for operationalizing the dependent variables only exists for European countries. To the author's knowledge there is no other dataset that equally satisfactorily capture individuals' willingness to cooperate for the environment in large-scale collective action problems. Although the 30 countries covered in this study show great variation in terms of trust levels, economic development and institutional quality it is still

a rather homogeneous sample compared to the rest of the world. However, a large share of the countries are EU members which could result in a set of shared norms and values among member states. In the same way, many of the eastern countries share a history of Soviet rule and communism which might lead individuals in those countries to have a different relation to and experience with political institutions than their western counterparts. Thus, in this to some extent homogeneous sample there still exists a large variance with respect to factors influencing trust levels (Delhey & Newton, 2003) and is therefore well suited for an analysis of trust-context.

The dependent variables are measuring respondents' cooperative intentions rather than actual behaviour. Pro-environmental behaviour theory ultimately is about understanding actual behaviour, and intentions only partially explain behaviour. Unfortunately, this is a common feature of survey based research on pro-environmental behaviours. In a review-article on pro-environmental behaviour studies it was shown that a third of the articles examine intention rather than behaviour, and that only a tenth of those are transparent about it (Yuriev et al., 2020). However, measuring intention rather than behaviour should to some extent mitigate bias stemming from the 'social desirability' that otherwise is associated with respondents' self-reported behaviour (Krumpal, 2013). Furthermore, items intended to measure actual behaviour (e.g. recycling) typically do not cover any reasoning behind the behaviour which would render them inadequate for this thesis' framework.

As for causality, associated with the use of cross-sectional data is that it is impossible to disentangle any questions regarding cause and effect since data only represents a single point in time. Even if it is implausible from a theoretical standpoint that the dependent variables would cause social and political-institutional trust, due to the nature of the data, it cannot be ruled out for certain. One can, however, use data from an earlier point in time, as was done with economic development, in an attempt to at least partly compensate for this limitation.

5. METHODOLOGY

The examination of the relationship between trust and cooperation is well suited for regression analysis. However, the respondents in the data are clustered in different countries and to account for the dependency among observations that this entails, multilevel models are appropriate. Assuming observations to be independent when they in fact are not might lead to standard errors being too small and type I errors, in which a true null hypothesis is falsely

rejected. Multilevel models also enable for the analysis of how a variable's effect varies across countries by calculating variance components both from within and between groups. Furthermore, state capacity and GDP/Capita are second-level variables that do not vary within countries. Mixing first-level variables and second-level variables necessitates multilevel models.

The dependent variables are measured on an ordinal scale, but it is often considered that if an ordinal variable has at least five response categories it can be treated as approximately continuous without risking any serious estimation bias (Hox, 2010). Especially so if the underlying concept to be measured also is of a continuous nature. Treating the variables as continuous instead of ordinal has the advantages of being both easier to interpret and more intuitive to understand compared to the logistic estimations that is otherwise needed. Multilevel mixed-effects linear regression models are appropriate for continuous outcome variables (Mehmetoglu & Jakobsen, 2017).

However, to justify the use of multilevel models the intraclass correlation coefficient (ICC) are calculated. By dividing the between-group variance in the dependent variables by the sum of between- and within-group variance it is estimated how much of the variation that can be attributed to the second level. If no between-group variance exists there is no need to do multilevel analysis since all variance is explained at the lower level. It is suggested that if the ICC is above 5 percent, multilevel models are warranted (Mehmetoglu & Jakobsen, 2017, p. 203). For first-order cooperation the ICC is 8.7 percent and 9.2 percent for second-order cooperation, indicating that about 9 percent are explained by country-level factors and the data is therefore suitable for multilevel analysis.

The strength of a multi-level model is that it explains variance in the cooperation variables stemming from both individual and contextual factors. Of interest in this thesis is the possibility that trust-context might alter the individual-level trust-cooperation link. Allowing trust coefficients to vary between countries (random slopes) enables such inquiries (Mehmetoglu, 2017, p. 210). Apart from being theoretically motivated, it is also recommended that random slope models should significantly improve model fit. Likelihood-ratio-tests were run to compare fixed-effects to random-slope models. All tests were significant at the .001 level and random-slope models are therefore an appropriate way to investigate the data.

Two types of analyses are run. First, the relationship between trust, first-, and second-order cooperation are investigated using the whole sample. These analyses provides the basis for the hypothesis testing. Secondly, trust-context are explored by analysing two subsamples –

the five most and least trusting countries – to see whether the role of trust in facilitating cooperation is insensitive to context.

5.1 Diagnostics

In order to obtain correct estimates from multilevel regression analysis certain assumptions must be met. As discussed, ordinal variables with at least five categories are treated as continuous, including the dependent variables. Therefore many of the assumptions for standard OLS can be applied to the multilevel framework. By treating ordinal variables as continuous the assumption of linearity is met, and a one unit increase in any of the continuous variables therefore corresponds to a constant change in the outcome variable (Mehmetoglu & Jakobsen, 2017, p. 137).

Whether there are multi-collinearity in the models are checked by calculating the variance inflation factors. VIF-values exceeding the value of five may indicate that there is a problem with multicollinearity (Mehmetoglu & Jakobsen, 2017, p. 147). Even after accounting for correlation within clusters it unfortunately turns out that both GDP/Capita and state capacity have values over seven. Although not measuring the same underlying phenomena the correlation between the two variables are far too high (r=.93, p<.01) to warrant the inclusion of both. GDP/Capita is therefore excluded from the analyses since it is more theoretically motivated to include a measure of state capacity[6]. This is generally a problem when doing multilevel models with relatively few second-level observations and concepts that correlate to a large extent. Without GDP/Capita included in the models the VIF-values ranges from 1.02 to 1.29 and it is concluded that multicollinearity no longer exists in the models[7].

A Breusch-Pagan test for heteroskedasticity is run on each model. Results indicate that the error terms might suffer from heteroskedasticity, meaning that there is risk for inflicting bias when estimating standard errors. But it should be noted that multilevel models typically accounts for dependency among error terms since the very idea of such models is to deal with clustered observations. Moreover, the influence of a categorical variable on the outcome variable naturally varies across their constituting components, i.e. the influence of the low-educated category compared to the high-educated category on an outcome variable may differ both in terms of effect size and significance levels, even though they are parts of the same

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[6] As a test of robustness, full models were tested with GDP/Capita, resulting in no substantial differences for the hypothesis testing, see Appendix C: table C3.
[7] See Appendix B: table B1.

variable, and thus generating heteroskedasticity. Regardless, it should be kept in mind that this is a potential flaw in the models and it is therefore recommended that extra attention are given to the estimated standard errors and significance levels of the predictors.

As for the assumption of normally distributed errors, examinations of residuals as well as predicted values reveal that they are approximately normally distributed, except for some skewness to the left for the first-order cooperation model[8].

To make sure that no observations exerts unproportionally large influence on the outcome in the models, Cook's distance statistics are estimated. The analysis shows that no observations come nowhere near the cut-off value of 1 as the highest value in the first-order cooperation model is about 0.0025 and 0.0017 in the second-order model[9]. This is expected since it would be highly unlikely for a single observation among almost 32,000 observations to have disproportionate impact on the outcome.

5.2 Robustness tests

Since dependent variables are treated as continuous even though they are ordinal, the first test of robustness is to test whether the same results are obtained by running the full models in multilevel mixed-effects ordered logistic regressions. Results from the ordered logistic regressions tells the same story as the linear models and it is therefore concluded that linear models are justified. See Appendix C, table C1 for full results.

Using a dichotomous operationalization of the key concept of social trust might be considered a flaw, especially if there is an ambition to distinguish between individuals' different levels of generalized social trust. To compensate for this potential weakness, a social trust index is used. The index is made up of four items asking the respondent on a scale from 1-4 how much they trust people from various groups, where 1 is "trust completely", 2 "trust somewhat", 3 "do not trust very much", and 4 "do not trust at all". Groups included are: people i) in their neighbourhoods, ii) they meet for the first time, iii) of another religion, and iv) of another nationality. As such, the index is slightly more 'particularistic' than the conventional measurement of generalized trust (Sønderskov, 2009) and may therefore not entirely agree with generalized social trust theory, but as a proxy for 'people in general', and as a robustness test it should suffice. With an eigenvalue from a factor analysis showing 2.6 and a test of Cronbach's alpha resulting in 0.817, the index satisfactorily meets the requirements in terms of validity and

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[8] See Appendix B: figures B1-B6.
[9] See Appendix B: figures B7-B8.

reliability. The items are reversed so that higher scores corresponds to having more trust in other people. Except for minor changes regarding the effect size and significance levels of sex and age, the only substantial difference is that social trust operationalized with an index has a substantially larger effect on both outcome variables. Full results are found in Appendix C, table C2.

6. RESULTS

In this chapter results from the two different sets of analyses are presented: a) the relationship between trust, first-, and second-order cooperation, and b) the explorative investigation of trust-context.

6.1 Relationship between trust, first- and second-order cooperation

Results from the multilevel regressions showing the relationship between trust and first-order cooperation are found in table 6.1 and for second-order cooperation in table 6.2. In model 1 and 2 social trust and political-institutional trust are examined separately; and joined in model 3. The same procedure is used in model 4 and 5, with the difference that control variables are added. In model 6 all variables are included simultaneously and are referred to as 'full models'.

The constant, or intercept, in each model is the estimated mean when all independent variables are held at zero, and since dichotomous variables are included the constant therefore refers to a 15-29 year old, distrusting male with low education. All else held equal, the fixed-effects coefficients corresponds to the change in the dependent variables following a one-unit increase in any of the independent variables. Reported under random-effects are the estimated variances around the fixed-effect coefficients for the different variables and countries.

Table 6.1. Multilevel mixed-effects linear regression results for first-order cooperation.

First-order cooperation	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects – Individual level						
Social trust	.254***		.245***	.110***		.107***
	(.037)		(.035)	(.018)		(.018)
Pol.-inst. trust		.047	.012		.024	.011
		(.036)	(.032)		(.016)	(.015)
Awareness				.290***	.292***	.289***
				(.005)	(.005)	(.005)
Locus of control				.350***	.352***	.350***
				(.005)	(.005)	(.005)

Political ideology				-.016***	-.017***	-.015***
				(.002)	(.002)	(.003)
Income				.011***	.013***	.011***
				(.002)	(.002)	(.002)
Education: medium-low[a]				.107***	.115***	.106***
				(.028)	(.028)	(.028)
Education: medium-high[a]				.167***	.185***	.164***
				(.030)	(.030)	(.030)
Education: high[a]				.115*	.139*	.110
				(.057)	(.057)	(.057)
Female[a]				.039***	.038**	.039***
				(.011)	(.011)	(.011)
Age 30-49[a]				.047**	.047**	.048**
				(.017)	(.017)	(.017)
Age 50 and above[a]				.045**	.050**	.046**
				(.016)	(.016)	(.016)
Fixed effects – Country level						
State capacity				.155	-.032	-.053
				(.218)	(.244)	(.245)
Constant	3.302***	3.291***	3.270***	.991***	1.084***	1.118***
	(.063)	(.089)	(.087)	(.161)	(.181)	(.181)
Random effects						
Social trust (var)	.033		.027	.004		.004
	(.011)		(.009)	(.002)		(.002)
Pol.-inst. trust (var)		.034	.025		.004	.003
		(.010)	(.008)		(.002)	(.002)
Constant (var)	.114	.202	.193	.061	.067	.068
	(.031)	(.059)	(.057)	(.016)	(.021)	(.021)
Residual (var)	1.286	1.299	1.278	.956	.958	.955
	(.010)	(.010)	(.010)	(.008)	(.008)	(.008)
Log likelihood	-49456.538	-49628.703	-49388.633	-44704.617	-44743.349	-44697.211
AIC	98923.08	99267.41	98791.27	89441.23	89518.7	89430.42
Chi-bar-squared distribution	2196.96***	2542.86***	2331.62***	1447.14***	1410.54***	1449.96***
N (country level)	29	29	29	29	29	29
N (individual level)	31957	31957	31957	31957	31957	31957

Comment: ***p<.001, **p<.01, *p<.05. Standard errors in parentheses. [a]: comparison category.

Because of missing data on state capacity, Georgia is unfortunately excluded from the upcoming analyses[10]. The relationship between generalized social trust and first-order cooperation are found to be both positive and significant and the first hypothesis is therefore supported. The effect size is maintained after the inclusion of political-institutional trust. The effect is small, however, and gets even smaller after the inclusion of control variables. In the full model, the difference between a trusting and a non-trusting individual is on average about 0.1 on an outcome variable that ranges from 1 to 5. Random effects ranges from about 0.03 in Armenia to 0.2 in Switzerland as can be seen in figure D1 in Appendix D. As hypothesized, political-institutional trust does not have an effect on first-order cooperation. Being aware of

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[10] A separate analysis on Georgia was run, neither social nor political-institutional trust was significant predictors of first-order cooperation. Although interesting results in its own, it is decided that separate analyses on Georgia will not be included. However, the upcoming exploration of trust-context includes Georgia.

the threats facing the environment and having an internal locus of control is found to be strong predictors of first-order cooperation. For awareness, moving from the lowest to the highest value results in an increase in first-order cooperation of about 1.45, and 1.75 for locus of control. Political ideology is negatively correlated to first-order cooperation, meaning that the more rightward-leaning an individual are, the lesser inclined they are to cooperate for the environment. The difference between the two ideological extremes corresponds to a marginal change in the dependent variable of -0.15. Household income is a significant, albeit small, factor explaining first-order cooperation; belonging to higher income deciles increase individuals' propensity to cooperate for the environment. Education seems to increase individuals cooperative tendencies, but the highest category (doctor and above) is insignificant in the full model. The difference between men and women is significant but not of substantial value. The same goes for age, being older than 29 years constitute a significant increase in the dependent variable, but the effect is small. That so many individual-level variables are significant, yet having small effect-sizes, may stem from the fact that large sample-sizes tend to decrease p-values. On the country-level state capacity is shown to be an insignificant predictor of first-order cooperation.

The Akaike Information Criterion (AIC) tests the balance between goodness-of-fit and over-fitting the data. It does not say much on its own, but if the AIC is lower compared to another model's AIC it is considered to better fit the data. The AIC is lowest in model 6 and accordingly it is the model that best fits the data.

Table 6.2. Multilevel mixed-effects linear regression results for second-order cooperation.

Second-order cooperation	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Fixed effects – Individual level						
Social trust	.274***		.242***	.179***		.151***
	(.025)		(.023)	(.019)		(.019)
Pol.-inst. trust		.192***	.160***		.176***	.158***
		(.030)	(.028)		(.019)	(.018)
Awareness				.205***	.206***	.203***
				(.006)	(.006)	(.006)
Locus of control				.060***	.063***	.059***
				(.006)	(.006)	(.006)
Political ideology				-.024***	-.029***	-.027***
				(.003)	(.003)	(.003)
Income				.007**	.008**	.006*
				(.002)	(.002)	(.002)
Education: medium-low[a]				.135***	.144***	.137***
				(.031)	(.031)	(.031)
Education: medium-high[a]				.322***	.336***	.313***
				(.033)	(.033)	(.033)

	(1)	(2)	(3)	(4)	(5)	(6)
Education: high[a]				.459*** (.061)	.476*** (.061)	.445*** (.061)
Female[a]				-.044*** (.012)	-.049*** (.012)	-.048*** (.012)
Age 30-49[a]				-.152*** (.019)	-.149*** (.019)	-.147*** (.019)
Age 50 and above[a]				-.126*** (.018)	-.123*** (.018)	-.126*** (.018)
Fixed effects – Country level						
State capacity				-.697** (.265)	-.970** (.348)	-.999** (.344)
Constant	3.243*** (.064)	2.889*** (.104)	2.870*** (.101)	2.922*** (.196)	2.759*** (.255)	2.795*** (.252)
Random effects						
Social trust (var)	.011 (.005)		.008 (.004)	.005 (.003)		.004 (.003)
Pol.-inst. trust (var)		.022 (.007)	.018 (.006)		.007 (.003)	.006 (.002)
Constant (var)	.117 (.031)	.287 (.082)	.273 (.078)	.091 (.024)	.144 (.043)	.141 (.042)
Residual (var)	1.207 (.010)	1.208 (.010)	1.194 (.009)	1.119 (.009)	1.115 (.009)	1.110 (.009)
Log likelihood	-48251.705	-48289.18	-48113.118	-47039.868	-46998.817	-46933.155
AIC	96513.41	96588.36	96240.24	94111.74	94029.63	93902.31
Chi-bar-squared distribution	2305.27***	2440.19***	2550.87***	1964.78***	2088.03***	2110.44***
N (country level)	29	29	29	29	29	29
N (individual level)	31835	31835	31835	31835	31835	31835

Comment: ***p<.001, **p<.01, *p<.05. Standard errors in parentheses. [a]: comparison category.

Table 6.2 shows that both generalized social and political-institutional trust are significant predictors of second-order cooperation, therefore rendering support for hypothesis two and three. The effect of both variables is larger when analysed in isolation, and reduces once controls are added. Both coefficients are 0.15 in the full models. However, considering that political-institutional trust ranges from 1-4 means that it has a greater impact than social trust on the dependent variable. Moving from 1 to 4 corresponds to a change of 0.6 in dependent variable, compared to the effect of 0.15 by social trust (since it is dichotomous the coefficient directly translates to the effect it has on the dependent variable). A visualization of the random effects of social and political-institutional trust are found in Appendix D, figure D2-D3. Worth noting is that regardless individuals political-institutional trust in Spain, it will not alter their propensity to cooperate in second-order scenarios, whereas the difference between a low-trusting individual and a high-trusting individual in the Netherlands corresponds to a change in the outcome variable of more than 1.2.

The relationship between the control variables and second-order cooperation show some noteworthy differences compared to first-order cooperation. Perhaps most interesting is that state capacity not only is significant but that it is also negatively correlated to second-order cooperation, contrary to what was expected. Awareness now seems to be a more important

factor for second-order cooperation than locus of control, the opposite to what was found in table 6.1. In second-order cooperation women are marginally less inclined to cooperate than men, and compared to first-order cooperation, being older is now negatively correlated to cooperation.

Political ideology, household income and education behaves the same in second-order as in first-order cooperation, with the difference that the highest category of education also is significant in the full model, with a coefficient of 0.445.

The AIC is once again lowest in model 6, making it superior to the other models.

Figure 6.1. Estimated coefficients from first- and second-order cooperation analyses.
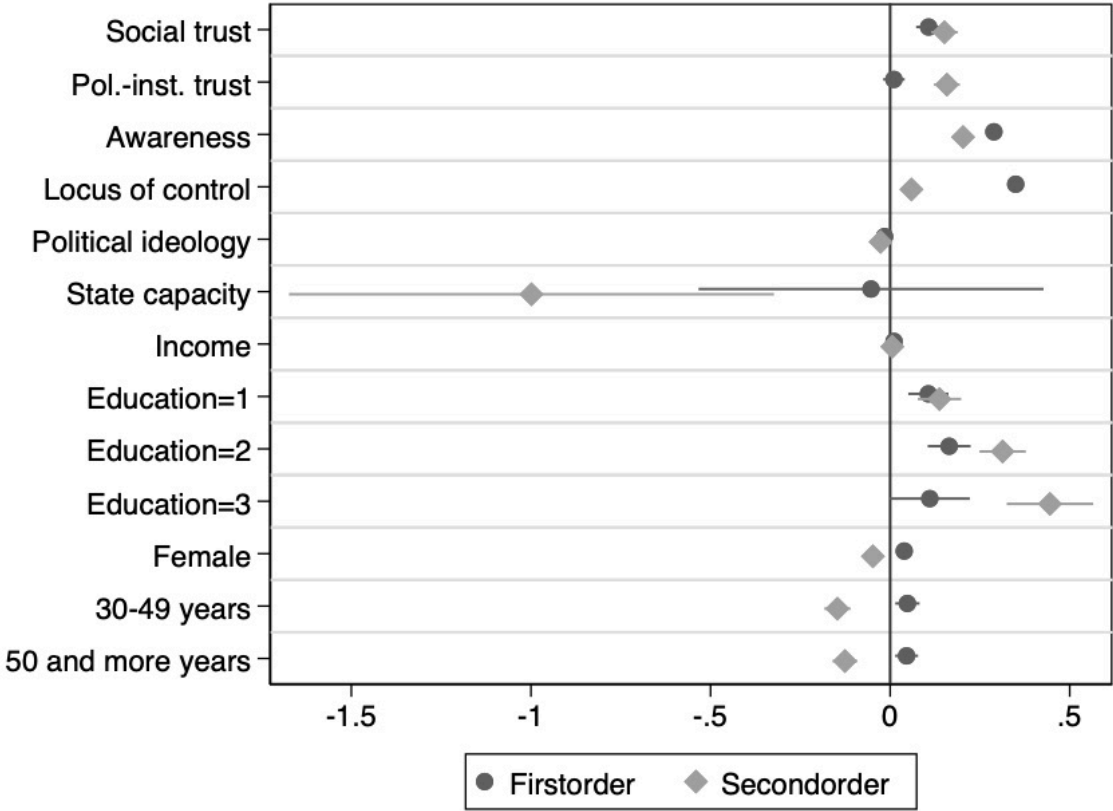
Comment: Unstandardized coefficients with 95% confidence intervals.

Figure 1 summarizes the variable coefficients from first- and second-order cooperation. Since these are unstandardized coefficients they cannot be compared to each other without taking the different scales on which they are measured into account; see table 4.1 under section 4.3 for descriptive statistics. That state capacity has large confidence intervals is partly explained by the relatively few observations (29) on the country-level.

6.2 Exploration of trust-context

The second part of the this chapter deals with the exploration of trust-context and how it might alter the relationship between trust and first- and second-order cooperation. Aggregated social trust scores were calculated to be able to differentiate between low- and high-trust countries. Multilevel regressions were performed on subsamples consisting of the five most (Denmark, Norway, Finland, Sweden and Iceland), as well as least (Albania, Georgia, Romania, Croatia and Bulgaria) trusting countries. State capacity is excluded since there are too few observations on the country-level. Results are presented in table 6.3 and 6.4. Although control variables reveal interesting findings, this section primarily focuses on the role of trust.

Table 6.3. First-order cooperation in high- and low-trusting countries.

First-order cooperation	High 1	High 2	High 3	Low 1	Low 2	Low 3
Fixed effects – Individual level						
Social trust	.354***		.079**	.168*		.078
	(.030)		(.027)	(.068)		(.046)
Pol.-inst. trust		.240***	.082**		-.121***	-.045
		(.038)	(.027)		(.033)	(.025)
Awareness			.229***			.308***
			(.012)			(.013)
Locus of control			.387***			.243***
			(.011)			(.013)
Political ideology			-.020***			-0.15**
			(.005)			(.005)
Income			.005			.023***
			(.005)			(.006)
Education: medium-low[a]			.275***			-.092
			(.061)			(.087)
Education: medium-high[a]			.230***			-.015
			(.062)			(.093)
Education: high[a]			.141			-.389
			(.113)			(.238)
Female[a]			.105***			-.060*
			(.023)			(.030)
Age 30-49[a]			.152***			-.034
			(.037)			(.044)
Age 50 and above[a]			.139***			-.007
			(.034)			(.042)
Fixed effects – Country level						
Constant	3.485***	3.100***	.892***	3.267***	3.537***	1.744***
	(.077)	(.075)	(.121)	(.198)	(.184)	(.205)
Random effects						
Social trust (var)	1.3e-10		3.0e-13	.009		2.3e-14
	(2.6e-09)		(1.9e-10)	(.013)		(1.4e-11)
Pol.-inst. trust (var)		.003	.0005		.002	8.2e-15
		(.002)	(.002)		(.004)	(1.8e-13)
Constant (var)	.026	2.8e-12	.017	.195	.153	.133
	(.017)	(5.6e-11)	(.017)	(.124)	(.110)	(.085)
Residual (var)	1.255	1.266	.936	1.345	1.344	1.060
	(.021)	(.022)	(.016)	(.028)	(.028)	(.022)
Log likelihood	-11191.68	-11224.57	-10124.03	-7471.355	-7468.317	-6902.191
AIC	22393.37	22459.15	20282.05	14952.71	14946.63	13838.38

Chi-bar-squared distribution	129.75***	110.28***	113.26***	587.37***	524.57***	461.93***
N (country level)	5	5	5	5	5	5
N (individual level)	7298	7298	7298	4759	4759	4759

Comment: ***$p<.001$, **$p<.01$, *$p<.05$. Standard errors in parentheses. [a]: comparison category.

Model 'high 1' and 'high 2' shows both social trust and political-institutional trust to be significant and positive predictors of first-order cooperation in high-trusting countries. While still significant, their coefficients decreases when both are included with controls in model 'high 3'. Contrary to what was hypothesized, political-institutional trust show a positive and significant relationship with first-order cooperation in high-trust countries. Thus, both social trust and political-institutional trust help to explain first-order cooperation in high-trusting countries.

When social trust is analysed in isolation in 'low 1' it is positively correlated to cooperation, but insignificant in the full model. Political-institutional trust are negatively correlated to cooperation in low-trusting countries but the relationship turns insignificant in the full model. According to the full model, in low-trusting countries neither social trust nor political-institutional trust help to explain first-order cooperation.

Table 6.4. Second-order cooperation in high- and low-trusting countries.

Second-order cooperation	High 4	High 5	High 6	Low 4	Low 5	Low 6
Fixed effects – Individual level						
Social trust	.271*** (.029)		.065* (.028)	.169* (.070)		.132 (.073)
Pol.-inst. trust		.259*** (.031)	.192*** (.026)		.027 (.043)	.046 (.039)
Awareness			.253*** (.012)			.108*** (.013)
Locus of control			.049*** (.012)			.062*** (.012)
Political ideology			-.064*** (.006)			.007 (.005)
Income			-.001 (.005)			.009 (.006)
Education: medium-low[a]			-.044 (.063)			.248** (.081)
Education: medium-high[a]			.083 (.066)			.269** (.087)
Education: high[a]			.366** (.117)			.351 (.223)
Female[a]			-.108*** (.024)			-.027 (.029)
Age 30-49[a]			-.159*** (.039)			.042 (.041)
Age 50 and above[a]			-.129*** (.035)			.052 (.040)
Fixed effects – Country level						

Constant	3.257*** (.109)	2.763*** (.135)	2.302*** (.145)	3.836*** (.167)	3.815*** (.172)	2.863*** (.202)
Random effects						
Social trust (var)	7.9e-14 (8.4e-11)		1.9e-18 (-)	.013 (.018)		.016 (.018)
Pol.-inst. trust (var)		.001 (.003)	6.9e-16 (-)		.006 (.006)	.005 (.005)
Constant (var)	.056 (.036)	.064 (.051)	.047 (-)	.139 (.088)	.135 (.092)	.133 (.090)
Residual (var)	1.141 (.019)	1.140 (.019)	1.000 (-)	.962 (.020)	.965 (.020)	.930 (.019)
Log likelihood	-10828.31	-10826.26	-10347.59	-6665.77	-6672.839	-6588.108
AIC	21666.61	21662.52	20721.18	13341.53	13355.68	13210.22
Chi-bar-squared distribution	251.70***	255.88***	240.38***	571.04***	551.72***	511.88***
N (country level)	5	5	5	5	5	5
N (individual level)	7286	7286	7286	4752	4752	4752

Comment: ***$p<.001$, **$p<.01$, *$p<.05$. Standard errors in parentheses. [a]: comparison category.

Both generalized social trust and political-institutional trust significantly predicts second-order cooperation in high-trust countries. In line with previous results the coefficients are reduced after the inclusion of control variables in 'high 6', but still significant. The coefficient of social trust, 0.065, indicates that there are barely no difference between a trusting and a distrusting individual in high-trusting countries when it comes to second-order cooperation. Social trust is significant in 'low 4' but turns insignificant in the full model, 'low 6'. Political-institutional trust is insignificant in both 'low 5' and 'low 6'. Thus, both aspects of trust show no relationship with second-order cooperation in low-trust countries.

To sum up the analysis on trust-context, generalized social trust and political-institutional trust seems to be a facilitator of both first- and second-order cooperation in high-trust countries, whereas they have no relationship with cooperation in low-trust countries after the inclusion of controls.

7. DISCUSSION

It was hypothesized for social trust to be positively linked to both first- and second-order cooperation, and that political-institutional trust only are linked to second-order cooperation. For first-order cooperation political-institutional trust were hypothesized to have no relationship. Based on the main investigation all hypotheses were supported. People trusting other people in general – all else held equal - seems more likely to engage in collective action and to cooperate for the environment, regardless the action of others. People who have

confidence in the political-institutional system seems more inclined to contribute in second-order cooperation situations.

However, the effect of social trust on cooperation is small, the difference between a trusting individual and a non-trusting individual is on average next to negligible. Even in countries where generalized social trust has its greatest effect it only amounts to an increase of 0.2 steps on a five-step dependent variable. Using a social trust index instead results in average effects of .16 for first-order and .22 for second-order cooperation, so the effect is clearly larger, especially when considering that it ranges from 1-4[11]. But it should be noted that the index agrees more with a 'particularistic' form of trust. The correlation between the two measurements are 0.49, indicating a rather low correlation considering that they ought to measure the same underlying phenomena. Both measurements obviously has to do with trust in other people, even if they do not agree fully on a theoretical level. But it also raises questions as to how much of the results are driven by the fact that one measurement is dichotomous and the other continuous. In many datasets frequently used in empirical research, the item asking respondents about their trust in other people often use a continuous scale of 1-5 or 0-10. Perhaps the strong link between social trust and cooperation found in previous research is driven, in part, by the fact that a trust-scale with many steps might result in an exaggeration of the correlation between trust and cooperation. It is of course possible to have 'more' or 'less' trust in other people, but complications arise when subjective perceptions are quantified in order for them to be compared. It was discussed previously that the meaning of 'people in general' are associated with uncertainties as to what it actually is referring to. An issue to consider is the possibility that the meaning of trust might differ between countries. That is, do a high-trusting individual in Albania trust 'other people in general' to the same extent as a high-trusting individual in Sweden does? Put differently, is the scale equal across countries? There are no problems to technically differentiate between low- and high-trusting individuals within countries, but the question is whether they are comparable between countries from a substantial perspective.

Political-institutional trust are linked only to second-order cooperation. This is intuitive because without confidence in the political-institutional system's capacity to efficiently manage the task they are set to handle there is little point in funding such activities. The supported hypothesis that political-institutional trust do not have an effect on first-order cooperation is at first glance also intuitive. Why would one's trust in the political-institutional system affect

[11] See Appendix D: figure D4-D5 for random effects of the social trust index.

one's propensity to voluntarily cooperate for the environment? The political-institutional system obviously plays a role in creating opportunities for individual cooperation, but that rather has to do with the capacity, or quality, of said institutions than individuals' confidence in them. However, if political-institutional trust has a causal impact on generalized social trust, as was discussed above, then it would be premature to conclude that it does not have an impact on first-order cooperation.

A strength with these findings is that the measurements used for operationalizing first- and second-order cooperation agrees well to the logic of collective action, especially the item used for first-order cooperation. Most of the previous empirical research 'proxy' collective action with items asking about recycling habits (Harring et al., 2019; Sønderskov, 2009) or self-reported organic food consumption (Jagers & Robertson, 2018), in the present study the first-order item touches upon the core of the dilemma by asking whether individuals are willing to cooperate for the environment regardless the action taken by others. The item measuring second-order cooperation, however, is not necessarily an example of an enforced situation. To some extent it measures individuals' willingness to abide by such enforcement were they to be implemented. After all, the exact wording could lead them to think of it as a 'green tax' since it is stated "I would give parts of my income if I were certain that the money would be used to prevent environmental pollution". Even if it could imply a voluntary donation to a 'green fund', they ultimately put their trust in the institutions implemented to mitigate pollution. That fund might in turn use the funds to accumulate emission allowances in order to reduce pollution, a system managed by the political-institutional system. Also, the word 'certain' should make the question contingent upon individuals' trust-levels. Since it is implied that the money will safely end up where intended, it should amount to whether respondents trust and have confidence in the political-institutional system to responsibly and efficiently manage their contributions.

By exploring the hypotheses in high- and low-trusting countries some interesting results emerge. Social trust is now linked to first-order cooperation only in high-trusting countries. But it should be noted that the effect-size of trust is lower compared to the whole sample. Both social and political-institutional trust are still predicting second-order cooperation in high-trust countries. Moreover, in high-trust countries even political-institutional trust is a significant factor for first-order cooperation. Regardless the action taken by others, individuals trusting politicians and institutions are more inclined to cooperate for the environment, in high-trust countries. A possible explanation could be that those individuals trust that the state are capable of successfully encouraging free-riders into cooperation, so that their own contributions become meaningful. Returning once again to the debate on causality; it could also give some support

for the theory that the high-quality institutions found in these countries make people inclined to trust said institutions which also has the spill-over effect of generating social trust (Rothstein & Stolle, 2008), thus resulting in both social and political-institutional trust to be significant. The same reasoning might hold for low-trust countries, where neither social nor political-institutional trust significantly predicts any form of cooperation. The poor quality of the institutions in these countries are unable to generate sufficient levels of trust for it to be a useful predictor of cooperation. That political-institutional trust was significant and negatively correlated to first-order cooperation in 'low 2' but not in 'low 3', when controls were added, hints that the relationship was spurious in 'low 2'.

The exploration on trust-context goes in line with previous findings showing that individual-level trust only has a relationship with cooperation in societies where trust is high (Irwin & Berigan, 2013), as well as findings showing that the effect of trust on support for environmental protection varies across countries (Fairbrother, 2016). As such, the results also addresses the inquiry raised by Jagers and Robertson (2018) whether the relationship between trust and cooperation might differ in countries where generalized trust levels are lower. Moreover, the relative effect of individual-level trust in high-trust countries is small. By the look of it, it certainly seems that the role of trust in facilitating cooperation are dependent upon context.

The operationalizing of trust-context might leave much to be desired, however. Taking the five most and least trusting countries resulted in two samples that differ on many aspects other than just trust. All high-trust countries are Nordic countries where economic development is high and institutions impartial whereas the low-trust sample are characterized by low economic development and bureaucracies stifled by corruption, and so on.

Awareness and locus of control consistently have strong and substantial effects on cooperation throughout the models. In second-order cooperation, being aware of the threats facing the environment is comparatively more important than feeling that it is within one's capacity to do anything about it. That seems reasonable considering that in giving parts of one's income, that person leaves it to someone else to do the job and, vice versa, in first-order cooperation locus of control plays the relatively more prominent role of the two. In these situations it is not surprising that the more people feel that they themselves are able to actually influence the outcome, the more inclined they are to contribute, especially considering that first-order cooperation typically relies on individual direct action.

Perhaps this is part of an explanation as to why prospects for environmental cooperation seems to be so good even in countries where distrust is widespread. In Serbia and Armenia, for

example, over half of the respondents disagree to the statement that there is no point to do what they can for the environment unless others do the same, and that in countries where more than three quarters of respondents think that you cannot be too careful when dealing with other people. Even if individuals do not trust other people and the risk that the good might be insufficiently produced is imminent, they are willing to cooperate for the environment out of personal beliefs or convictions, or the saliency of the issue. On a side note, it should not be forgotten that environmental concern is not a necessary prerequisite for cooperation – economic incentives and cultural values, for example, also help in shaping pro-environmental behaviours (Kollmuss & Agyeman, 2002).

Previous literature has mainly focused on disentangling the concept of generalized social trust. Not much attention are given to what it means being a 'non-trusting' individual. Cook, Hardin and Levi (2005) differentiate between distrust as an active and a passive state, arguing that having a lack of trust is a passive state and are not to be confused with the problematic active state of distrust. It is therefore possible that in countries where people generally do not trust each other they are fully capable of cooperating because their lack of trust is of a passive character.

As for the other included factors they mostly behave as expected. Being left-leaning, more educated and having a relatively higher income are all linked to more positive attitudes towards environmental cooperation. But the effect of income, and thus the support for any affluence or post-materialist hypothesis, is weak. When accounting for trust-context, income is only significant in first-order cooperation in low-trust countries. However, closely related to income is the level of education, where higher education often yield higher incomes. It is therefore possible that income is partially expressed through education and it could thus be an explanation as to why education is significant in models when income is not, and vice versa. After all, the mean income (deciles) for the highly educated group is 7.4 and 3.2 for the baseline category of low education. Education has many facets, and apart from the income aspect, highly educated individuals might also have larger amounts of social and cultural capital, making them more likely to understand the present dilemma and the capacity to act upon it. Age and sex show some peculiar results. Being female and of older age is positively linked to first-order cooperation but negatively linked to second-order cooperation. All else equal, women and relatively older people seems to be somewhat more open to forms of cooperation that typically involves behavioural change, whereas men and younger people on average are more willing to pay for environmental solutions. It is difficult to know what these differences stem from, even more so when it seems to be true only in high-trust countries. Perhaps not too surprising,

however, since meta-analyses show both age and sex to exhibit mixed links to pro-environmental behaviours in general (Hines et al., 1987).

State capacity is negatively correlated to second-order cooperation and thus contrary to what was hypothesized. Meaning that in countries where institutions are impartial and rule of law is norm people are actually less inclined to give parts of their income to tackle environmental degradation. As counterintuitive as it may seem, there are some plausible explanations. People who are living in countries where the state is functioning well might feel that the environment is best taken care of the institutions already in place, rendering one's own contributions unnecessary. In countries where the state barely functions, people might think that it is up to they themselves to contribute for the environment since government are incapable of doing it.

Perhaps the most obvious limitation to the study is that the dependent variables only measure intentions, or attitudes, toward cooperation, and not actual behaviour. However, intentions and attitudes might be a good way of 'proxying' actual behaviour since self-reported behaviour are more heavily biased through social desirability and memory lapses (Duit, 2010; Sønderskov, 2009). With this in mind it is probably wise not to directly translate these findings into actual cooperation, but rather the willingness among individuals to cooperate for the environment.

Underlying this study is the assumption that individuals are conditional co-operators (Sønderskov, 2009), that is, individuals cooperate if other people cooperate. The present data does unfortunately not offer any explanations as to the reasoning behind their intentions, so the actual mechanism linking trust to cooperation are not investigated. But the theoretical links between trust and cooperation in social dilemmas are well proven so it is quite plausible that a variant of that mechanism is what links them together. Thus, what is measured is the direct effect of trust on individuals' willingness to cooperate.

Finally, it was shown that there potentially are some heteroskedasticity present in the models which might cause some relationships to be stronger than they actually are. But, considering that most significant results are significant at the 0.001 level should indicate that they probably would hold for the larger standard errors following from evenly distributed error terms as well.

8. CONCLUSION

The purpose of this thesis has been to deepen our knowledge regarding trust and its ability to facilitate cooperation for the environment in large-scale collective action dilemmas. More specifically, both generalized social trust and political-institutional trust were examined in order to distinguish their separate roles in first- and second-order cooperation; with the further possibility that the link between trust and cooperation might vary across trust-contexts. As such, this thesis adds to ongoing research on how factors proven benevolent in small-scale collective action fare when the size of the dilemma scales up.

The results tells us that generalized social trust is a significant facilitator of both first- and second order cooperation when the whole sample is analysed, and political-institutional trust are only linked to second-order cooperation. Thus, all hypotheses were supported, and to relate to the overarching research question, it seems as if both aspects of trust positively influences individuals propensity to engage in collective action for the environment. The results are in line with previous findings linking trust to cooperation (e.g. Irwin, 2019). However, when trust-context is explored it turns out that these findings only hold for countries with high levels of generalized social trust. While it is still possible for cooperation to occur in low-trust countries, individual levels of generalized social and political-institutional trust seems not to be a crucial prerequisite for that to happen. This brings about some implications for the role of trust in large-scale collective action, as it seems that individual levels of trust is next to irrelevant if individuals are living in contexts where most people do not trust each other. Moreover, this study has also shown that the effect of trust in fostering cooperation differ substantially across countries. As such, the strength of this thesis is its empirical contribution.

While the present study only serves to explore trust-context, further research should focus both theoretically and empirically on the interplay between trust as a societal feature and trust at an individual level. Due to the relatively small effect that trust had on cooperation in high-trust countries, perhaps individual levels of trust is simply not that relevant for cooperation in contexts where trust is high? The risks associated with cooperation might be perceived as lower in such contexts since individuals can assume most other people will cooperate anyways, and therefore their own outlook on the trustworthiness of others is of less importance. Similarly, a high-trusting individual in a low-trust context might be impelled to abstain cooperation since free-riding behaviour is widespread and the risk of being the sucker is evident. This actualises an even larger question. Due to the scale of most environmental problems, often spanning the whole world, there is a possibility that even in countries where trust is high, people will not

choose to cooperate since they know that for most parts of the world, trust is low. Even if individuals trust people in general and are nested in contexts with like-minded people, they might conclude that the best strategy still is to refrain from cooperation since they do not want to end up being suckers because of the imminent risk that less trusting people on the other side of the world will free-ride on their contributions.

What are the prospects for mitigating environmental threats such as climate change through the use of trust? Policy measures intended to increase environmental cooperation and compliance in low-trust countries might prove futile if they are to rely on generalized trust as the sole mechanism, whereas it might be a fruitful way to go in countries where societal trust levels are high. Because of its alleged benevolent effects on generating both political-institutional and social trust, measures should probably first be directed at increasing the quality of institutions, if social trust are to be a facilitator of environmental cooperation regardless the context. Luckily, however, individuals seem willing to cooperate for the environment even if they do not trust others to cooperate, as some of the other investigated factors show; especially being aware of the threats facing our environment and believing in one's own capacity to affect the outcome.

In conclusion, trust seems to be a facilitator of environmental collective action in some contexts, but the impact of trust varies and is contingent upon what kind of cooperation it entails. That is to say – the relevance of trust is relative.

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10. APPENDIXES

Appendix A. Participating countries

Country	n	Country	n	Country	n
Albania	1435	Finland	1199	Norway	1123
Azerbaijan	1800	France	1870	Poland	1352
Austria	1644	Georgia	2194	Romania	1613
Armenia	1500	Germany	5407	Russia	1825
Bulgaria	1560	Great Britain	1788	Serbia	1500
Belarus	1548	Hungary	1516	Slovak Rep.	1435
Croatia	1488	Iceland	2506	Slovenia	1076
Czech Rep.	1812	Italy	2277	Spain	1211
Denmark	3362	Lithuania	1448	Sweden	1194
Estonia	1304	Netherlands	2721	Switzerland	3660

Appendix B. Diagnostics

Table B1. Variance inflation factor

Variable	VIF	1/VIF
State capacity	1.29	0.774261
Social trust	1.27	0.785743
Locus of control	1.19	0.842848
Awareness	1.18	0.844421
Education	1.18	0.849262
Income	1.18	0.850831
Political-institutional trust	1.15	0.872142
Political ideology	1.04	0.959560
Age	1.03	0.973445
Sex	1.02	0.979419
Mean VIF	1.15	

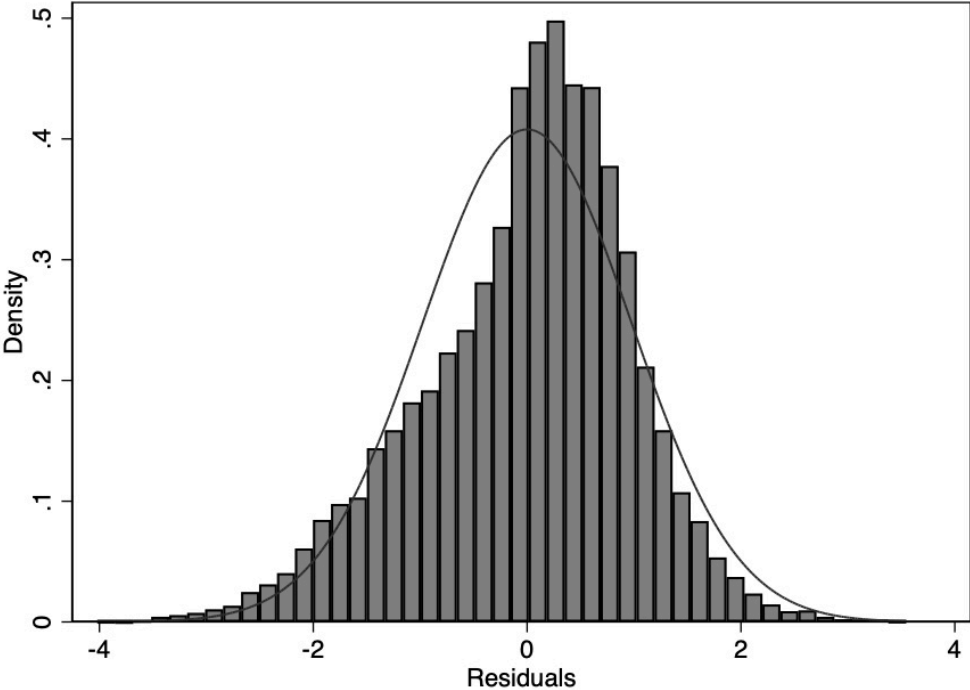**Figure B1. Distribution of residuals - first-order cooperation.**

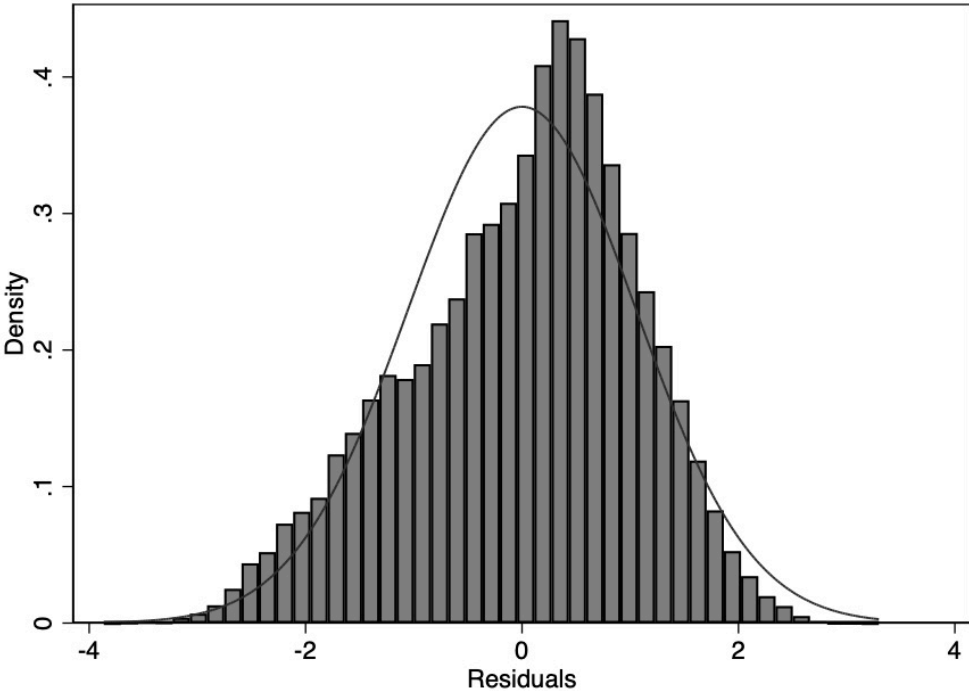**Figure B2. Distribution of residuals - second-order cooperation.**

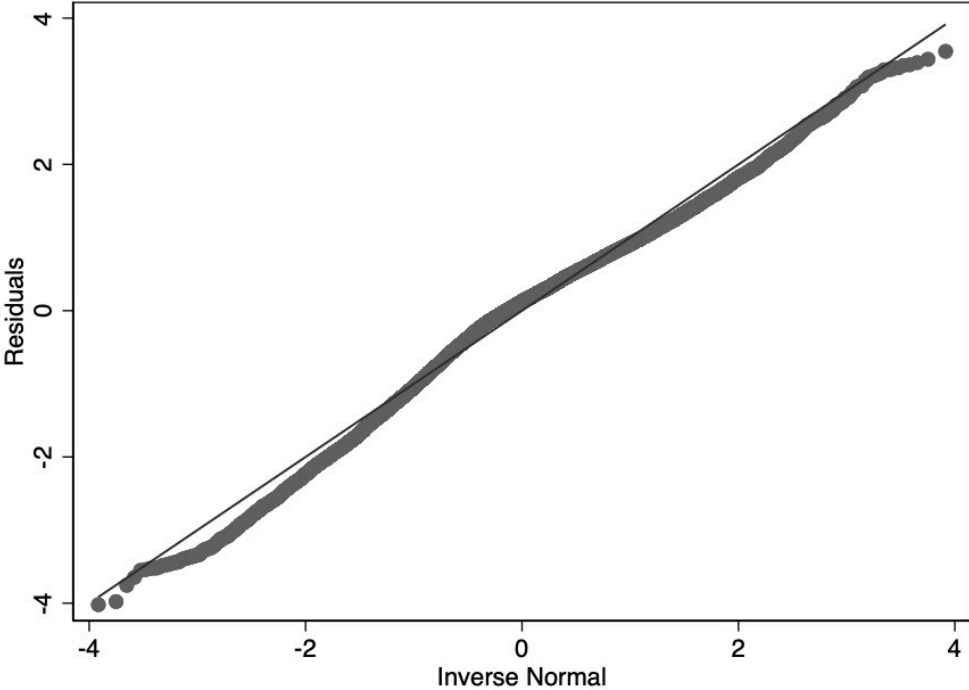**Figure B3. Q-norm plot: residuals - first-order cooperation.**

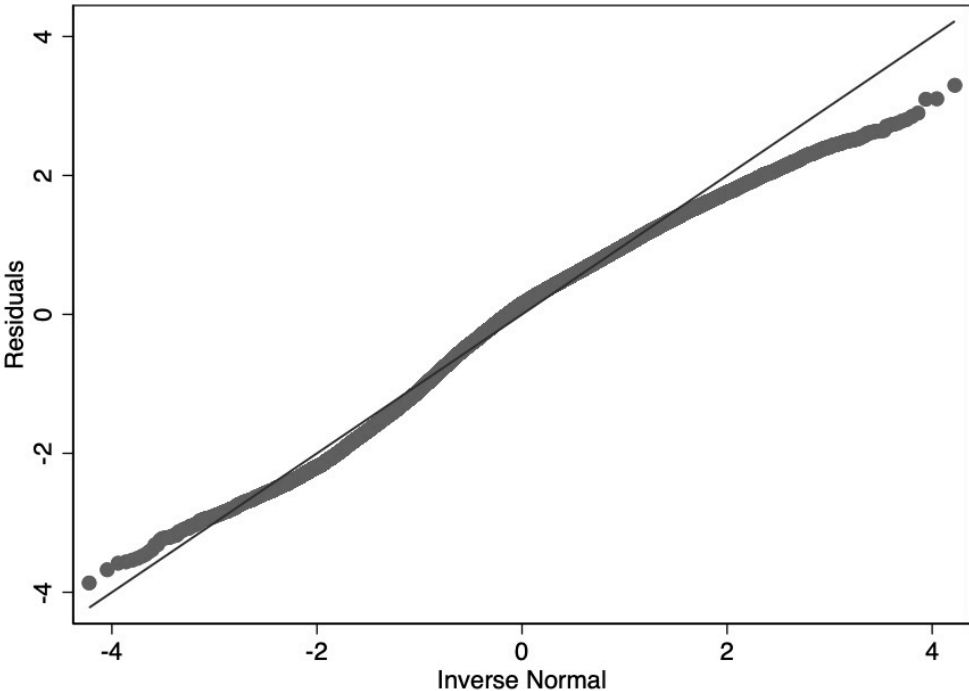**Figure B4. Q-norm plot: residuals - second-order cooperation.**

Figure B5. Q-norm plot: predicted values - first-order cooperation.
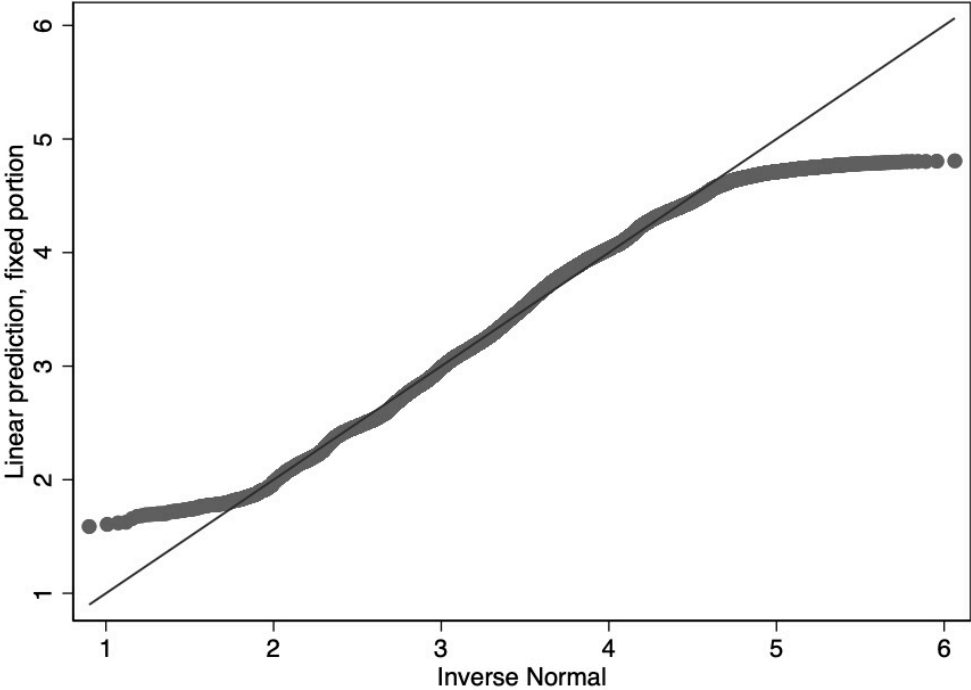

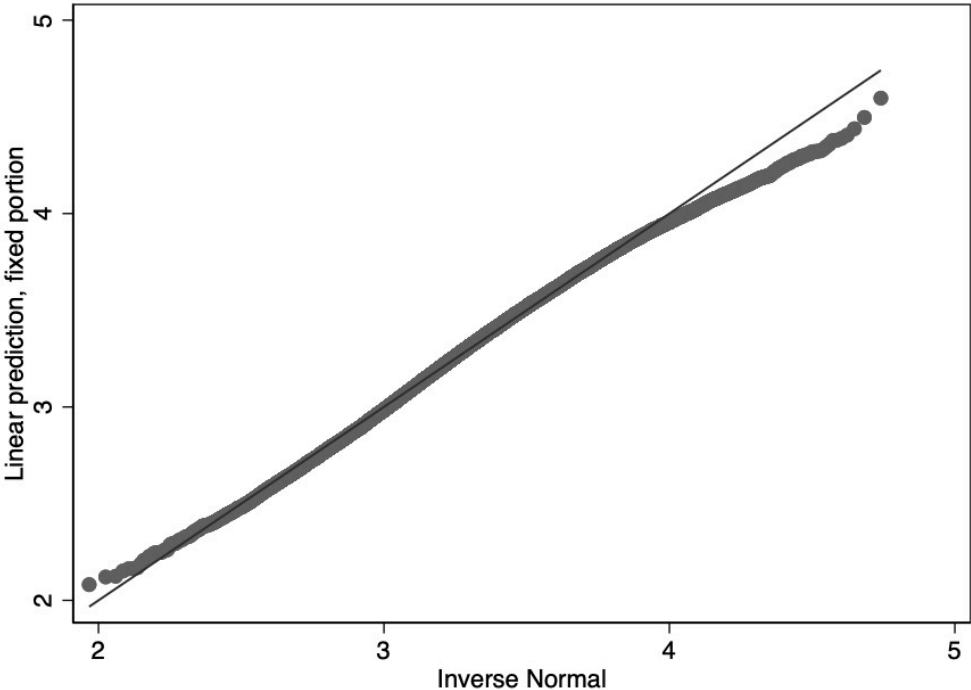**Figure B6. Q-norm plot: predicted values - second-order cooperation.**

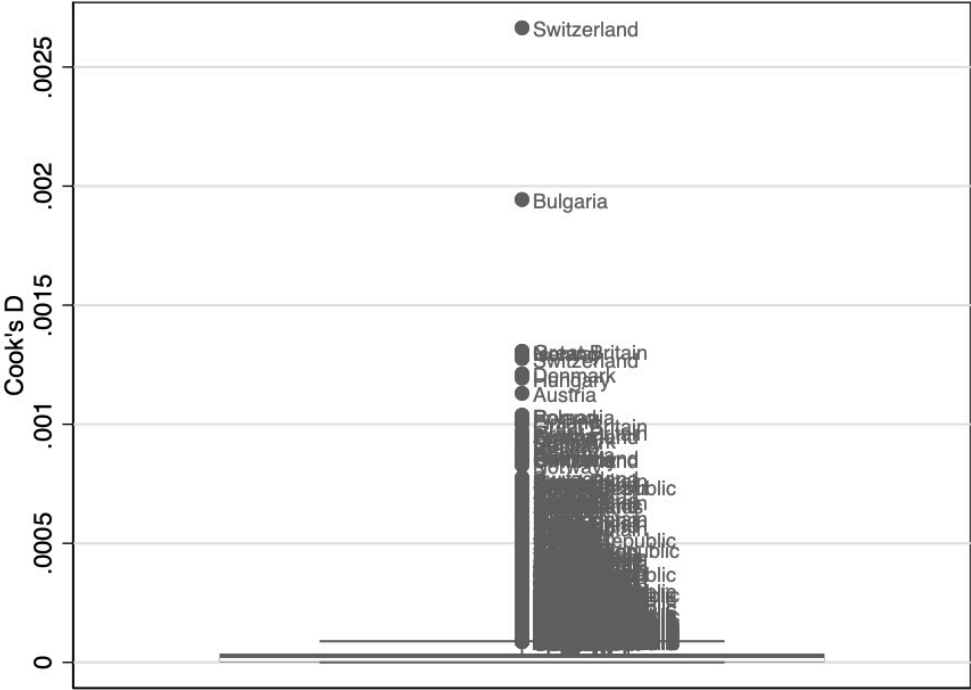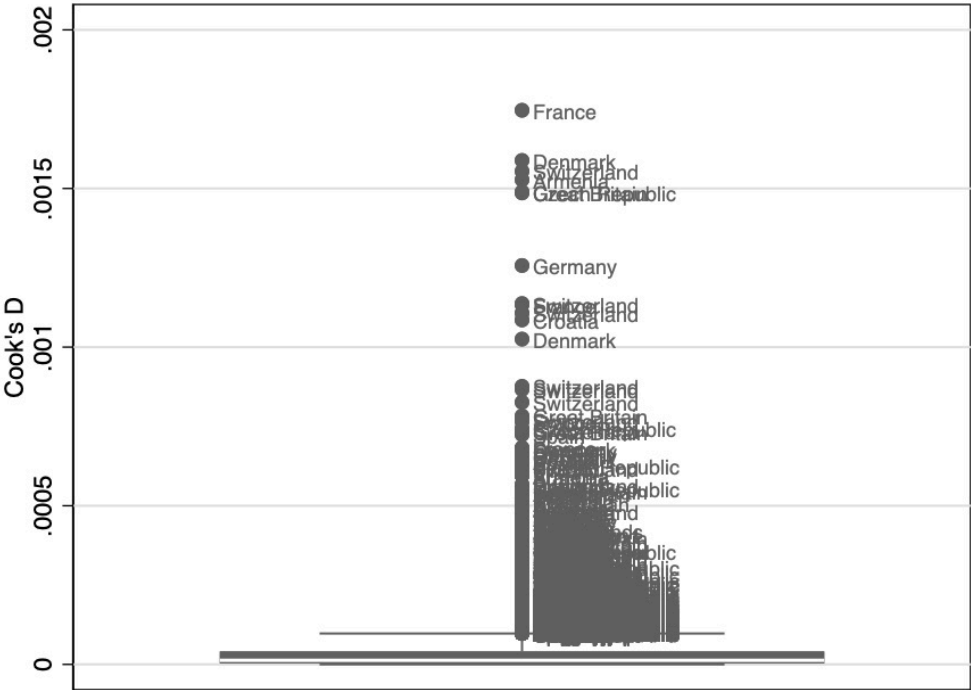**Figure B7. Cook's D – first-order cooperation.**

Figure B8. Cook's D – second-order cooperation.

Appendix C. Robustness tests

Table C1. First- and second-order cooperation using multilevel mixed-effects ordered logistic regression.

Dependent variable:	First-order cooperation	First-order cooperation	Second-order cooperation	Second-order cooperation
Fixed effects – Individual level				
Social trust	.392***	.187***	.393***	.246***
	(.058)	(.032)	(.038)	(.032)
Pol.-inst. trust	.011	.022	.249***	.260***
	(.054)	(.027)	(.047)	(.033)
Awareness		.600***		.384***
		(.011)		(.011)
Locus of control		.732***		.119***
		(.011)		(.010)
Political ideology		-.029***		-.051***
		(.005)		(.005)
Income		.017***		.009*
		(.004)		(.004)
Education: medium-low[a]		.190***		.206***
		(.054)		(.053)
Education: medium-high[a]		.295***		.513***
		(.058)		(.057)
Education: high[a]		.212		.813***
		(.110)		(.108)
Female[a]		.067**		-.098***
		(.021)		(.021)
Age 30-49[a]		.096**		-.269***
		(.033)		(.033)
Age 50 and above[a]		.094**		-.243***
		(.031)		(.031)
Fixed effects – Country level				
State capacity		-.105		-1.758**
		(.463)		(.621)
Cut point 1	-2.578	1.357	-1.821	-1.724
	(.149)	(.347)	(.174)	(.454)
Cut point 2	-.835	3.397	-.468	-.324
	(.148)	(.347)	(.174)	(.454)
Cut point 3	-.102	4.316	.662	.871
	(.148)	(.348)	(.174)	(.454)
Cut point 4	1.802	6.697	2.619	2.943
	(.148)	(.349)	(.174)	(.454)
Random effects				
Social trust (var)	.079	.012	.022	.012
	(.026)	(.007)	(.011)	(.008)
Pol.-inst. trust (var)	.071	.009	.052	.018
	(.022)	(.005)	(.017)	(.008)
Constant (var)	.562	.245	.801	.457
	(.165)	(.074)	(.228)	(.136)
Log likelihood	-45266.336	-40138.388	-45754.477	-44439.792
AIC	90550.67	80316.78	91526.95	88919.58
Chi-bar-squared distribution	2409.69***	1426.59***	2650.21***	2214.27***
N (country level)	29	29	29	29
N (individual level)	31957	31957	31835	31835

Comment: ***$p<.001$, **$p<.01$, *$p<.05$. Standard errors in parentheses. [a]: comparison category.

Table C2. First- and second-order cooperation using a continuous social trust index instead of a dichotomous operationalisation.

Dependent variable:	First-order cooperation	First-order cooperation	Second-order cooperation	Second-order cooperation
Fixed effects – Individual level				
Social trust: index	.309***	.158***	.317***	.218***
	(.034)	(.017)	(.024)	(.020)
Pol.-inst. trust		-.001		.138***
		(.016)		(.019)
Awareness		.286***		.201***
		(.006)		(.006)
Locus of control		.347***		.053***
		(.005)		(.006)
Political ideology		-.015***		-.028***
		(.003)		(.003)
Income		.010***		.005
		(.002)		(.002)
Education: medium-low[a]		.102***		.123***
		(.029)		(.031)
Education: medium-high[a]		.153***		.296***
		(.031)		(.034)
Education: high[a]		.093		.420***
		(.058)		(.063)
Female[a]		.038**		-.060***
		(.011)		(.012)
Age 30-49[a]		.049**		-.149***
		(.018)		(.019)
Age 50 and above[a]		.025		-.154***
		(.017)		(.018)
Fixed effects – Country level				
State capacity		-.366		-1.395***
		(.270)		(.372)
Constant	2.574***	1.019***	2.512***	2.676***
	(.086)	(.199)	(.096)	(.272)
Random effects				
Social trust: index (var)	.028	.005	.013	.007
	(.009)	(.002)	(.004)	(.003)
Pol.-inst. trust (var)		.003		.006
		(.002)		(.003)
Constant (var)	.183	.074	.237	.154
	(.056)	(.026)	(.070)	(.049)
Residual (var)	1.272	.950	1.190	1.098
	(.010)	(.026)	(.010)	(.009)
Log likelihood	-46315.297	-41920.52	-45165.696	-43957.997
AIC	92640.59	83877.04	90341.39	87951.99
Chi-bar-squared distribution	1896.29***	1308.05***	2221.88***	1909.52***
N (country level)	29	29	29	29
N (individual level)	30024	30024	29926	29926

Comment: ***$p<.001$, **$p<.01$, *$p<.05$. Standard errors in parentheses. [a]: comparison category.

Table C3. Multilevel regression: full models with GDP/Capita, and GDP/Capita plus state capacity, included.

Dependent variable:	First-order cooperation	First-order cooperation	Second-order cooperation	Second-order cooperation
Fixed effects – Individual level				
Social trust	.107***	.107***	.151***	.151***
	(.018)	(.018)	(.019)	(.019)
Pol.-inst. trust	.011	.011	.158***	.158***
	(.015)	(.015)	(.018)	(.018)
Awareness	.289***	.289***	.203***	.203***
	(.005)	(.005)	(.006)	(.006)
Locus of control	.350***	.350***	.060***	.060***
	(.005)	(.005)	(.006)	(.006)
Political ideology	-.015***	-.015***	-.027***	-.027***
	(.003)	(.003)	(.003)	(.003)
Income	.011***	.011***	.006*	.006*
	(.002)	(.002)	(.002)	(.002)
Education: medium-low[a]	.106***	.106***	.137***	.137***
	(.028)	(.028)	(.031)	(.031)
Education: medium-high[a]	.164***	.164***	.313***	.313***
	(.030)	(.030)	(.033)	(.033)
Education: high[a]	.110	.110	.445***	.445***
	(.057)	(.057)	(.061)	(.061)
Female[a]	.039***	.039***	-.048***	-.048***
	(.011)	(.011)	(.012)	(.012)
Age 30-49[a]	.048**	.048**	-.147***	-.147***
	(.017)	(.017)	(.019)	(.019)
Age 50 and above[a]	.046**	.046**	-.126***	-.126***
	(.016)	(.016)	(.018)	(.018)
Fixed effects – Country level				
State capacity		.072		.315
		(.636)		(.854)
GDP/Cap (log)	-.017	-.032	-.271**	-.341
	(.056)	(.152)	(.079)	(.204)
Constant	1.123***	1.131***	2.933***	2.923***
	(.190)	(.190)	(.254)	(.253)
Random effects				
Social trust (var)	.004	.004	.004	.004
	(.002)	(.002)	(.003)	(.003)
Pol.-inst. trust (var)	.003	.003	.006	.006
	(.002)	(.002)	(.002)	(.002)
Constant (var)	.068	.068	.128	.127
	(.021)	(.021)	(.039)	(.038)
Residual (var)	.955	.955	1.110	1.110
	(.008)	(.008)	(.009)	(.009)
Log likelihood	-44697.194	-44697.188	-46931.902	-46931.834
AIC	89430.39	89432.38	93899.8	93901.67
Chi-bar-squared distribution	1453.10***	1439.81***	1981.73***	1979.55***
N (country level)	29	29	29	29
N (individual level)	31957	31957	31835	31835

Comment: ***p<.001, **p<.01, *p<.05. Standard errors in parentheses. [a]: comparison category.

Appendix D. Visualizations of random effects
Figure D1. Random effects of social trust on first-order cooperation.
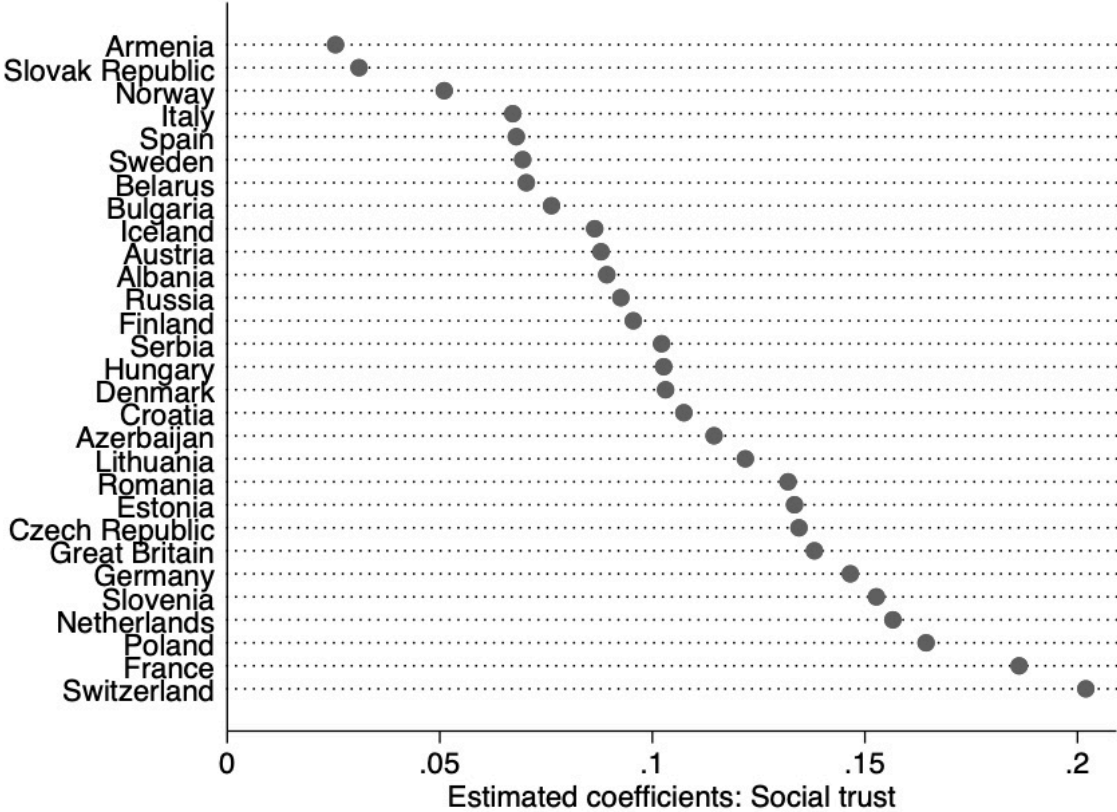

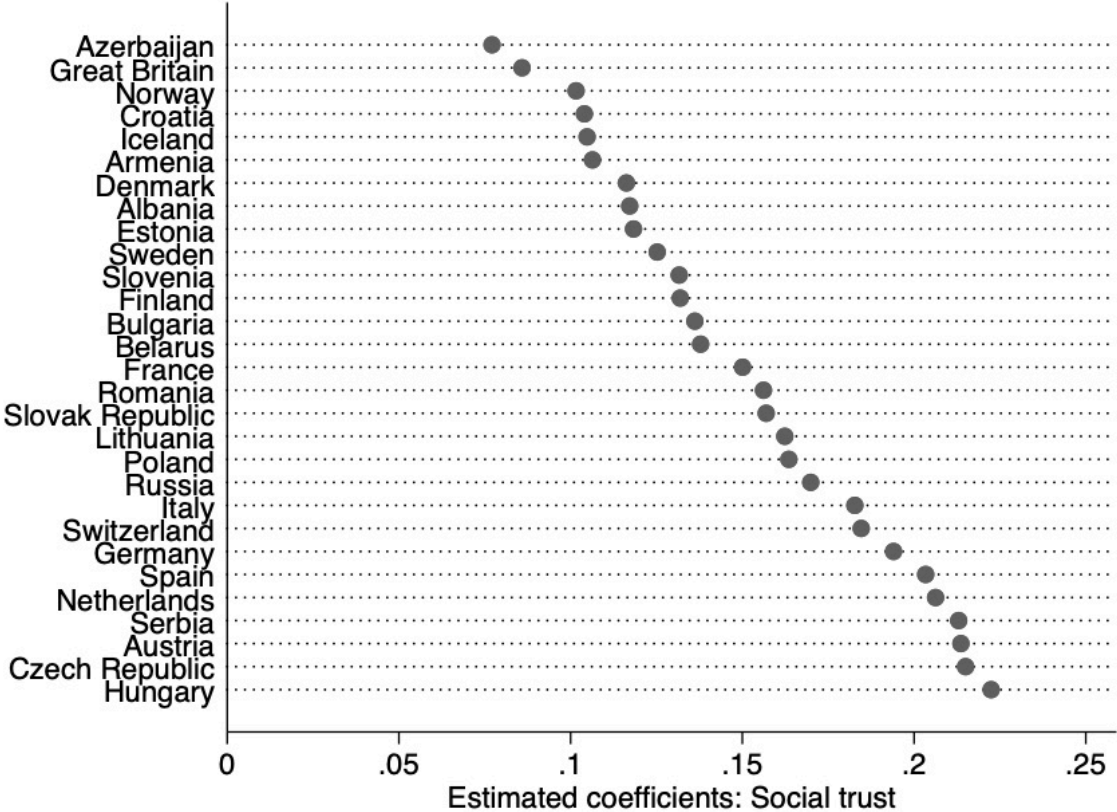## Figure D2. Random effects of social trust on second-order cooperation.

Figure D3. Random effects of political-institutional trust on second-order cooperation.
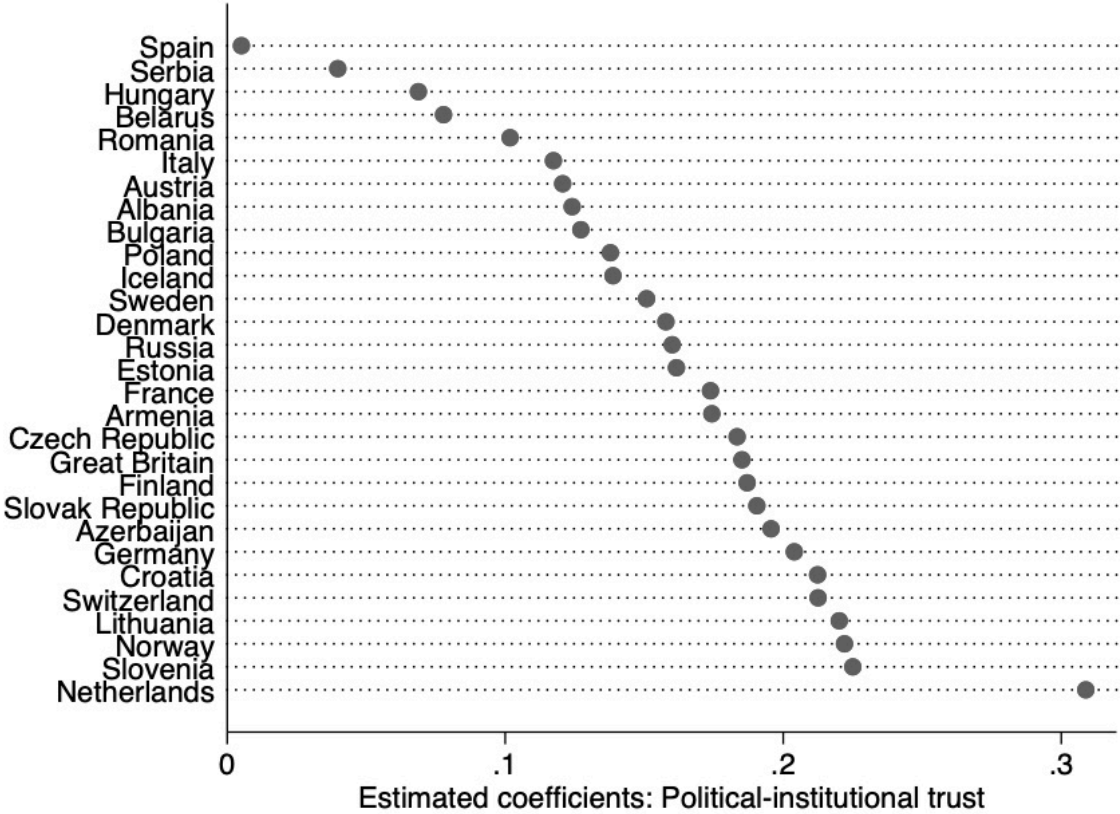

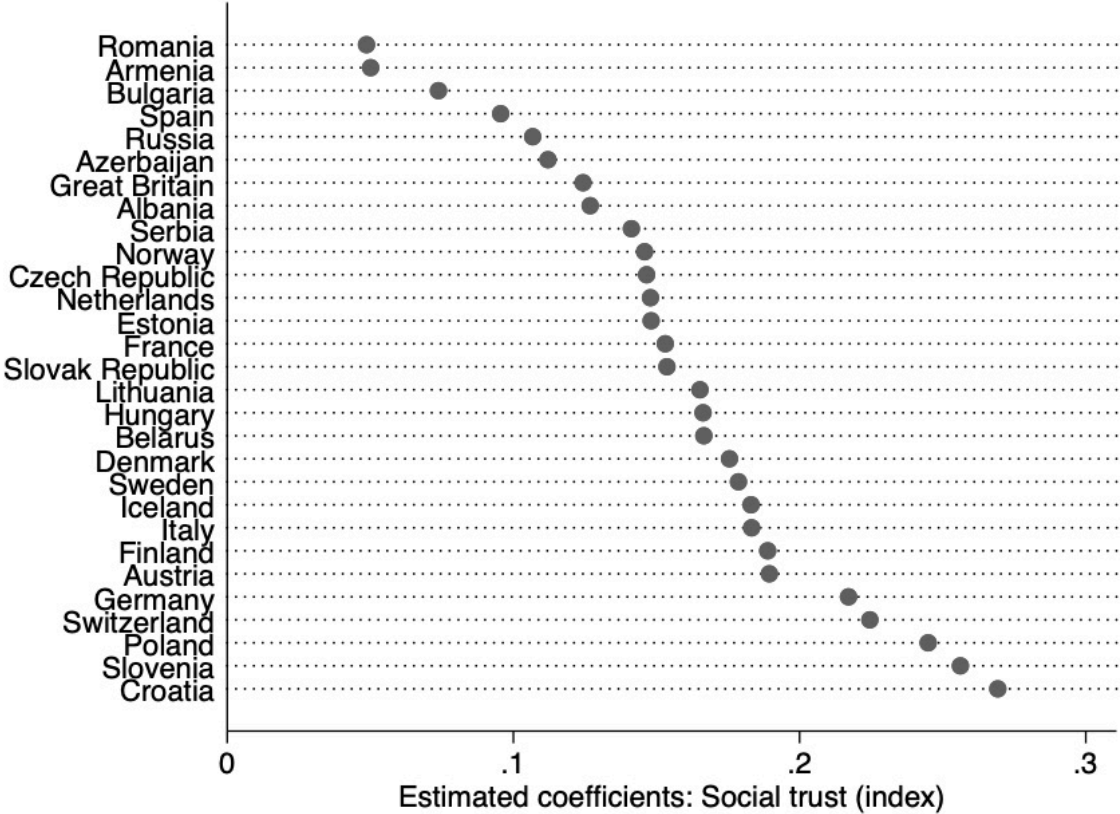**Figure D4. Random effects of social trust index on first-order cooperation.**

Figure D5. Random effects of social trust index on second-order cooperation.