HUMAN COOPERATION AND THE CRISES OF CLIMATE CHANGE, COVID-19, AND MISINFORMATION

By Paul A. M. Van Lange, David G. Rand

IN THIS BRIEF

To understand the issues, and to address them with meaningful interventions, it's helpful to consider human cooperation: how it began, how it's fostered, and how people can be motivated to look beyond self-interest.

Previous social science research in the lab has identified five mechanisms involved in the evolution of cooperation: kin selection, spatial selection, group selection, direct reciprocity, and reputation. Today, these mechanisms are still active, but need more testing in the field.

Climate change challenges cooperation, in part because it's difficult to see how actions taken today can have an impact on the climate in the future.

The COVID-19 pandemic tests notions of cooperation in another way: Actions taken (or not taken) affect not only one's own health, but also the health of the larger community.

Misinformation represents a broader type of cooperation challenge: Those who don't bother to check whether news is accurate before they share it save time, but may spread socially harmful falsehoods.

Contemporary society faces three major social dilemmas that we see characterized by a conflict between short-term self-interest and longer-term collective interest: climate change, COVID-19, and misinformation.

These three issues share important similarities. For instance, the costs of mitigating the climate crisis need to be paid today to reduce harms and risks in the future. Similarly, the COVID-19 pandemic requires the less vulnerable to pay costs and take actions that benefit those who are more vulnerable. And stemming the spread of misinformation requires efforts to both assess an abstract idea—namely, truth—and abstain from spreading attractive falsehoods.

To address each of these crises, we first need to understand human cooperation in three related areas:

- The evolution of cooperation, including mechanisms based on similarity and interaction.
- How reputation can incentivize cooperation via conditional cooperation and signaling.
- Social preferences that lead to cooperation, including positive regard for others, positive regard for ingroups, and positive regard for equality.

We also call for further research, especially tests of both theory and application conducted not only in the lab, but also in the field.

INTRODUCTION

Many of the severe challenges facing the world today are ultimately related to human cooperation. To illuminate these crises, we review empirical research on human

cooperation—a broad topic addressed by several disciplines including social and behavioral sciences, biology, climate science, and mathematics. Increasingly, the cross-fertilization of research activities and theories across these various disciplines yields the most comprehensive results.

In addition, we introduce the emerging literature on the three cooperation crises: climate change, COVID-19, and misinformation.

THREE APPROACHES TO COOPERATION

How did human cooperation arise? How is it fostered in society? And how can people be motivated to look beyond self-interest? These key questions are examined in the context of three primary approaches: the origins of cooperation, reputation, and regard for others.

1. Origins of Cooperation

Given the fundamentally selfish logic of natural selection and survival of the fittest, it may seem surprising that cooperation exists at all. A large body of research across the social and natural sciences has sought to explain the evolution of cooperation. Many of these works use the language of game theory to describe social dilemmas.

The game-theoretic framework has been used to demonstrate numerous ways in which cooperation can be avored by natural selection and spread through populations.

Five mechanisms have been identified as being involved in the evolution of cooperation (Nowak, 2006): kin selection, spatial selection, group selection, direct reciprocity, and reputation ***(Fig. 1).***

2. Reputation

Although each of the five mechanisms can allow for the evolution of cooperation, those involving reputation are particularly likely to be central to the cooperation among non-kin that forms the fabric of modern human societies (Rand & Nowak, 2013).

Essentially, reputation-based cooperation occurs when what others know about an individual's past actions—for example, through direct observation or gossip—affects how they act toward that individual now. This dynamic can make it worthwhile for an individual to cooperate in either of two main ways:

- **Conditional cooperation:** Often referred to as "reciprocity," this occurs when an individual cooperates today to receive the benefit of others' cooperation in the future.

- **Signaling:** Here, the individual cooperates to attract new partners. This cooperative act also functions as a signal; its message is that others will benefit from interacting with this individual in the future.

Fig. 1: Five Evolutionary Mechanisms of Cooperation

Mechanisms based on similarity between interaction partners	
Kin selection	The evolution of cooperation among genetically related individuals
Spatial selection	The development of cooperation within networks of individuals due to clustering of individuals with similar strategies
Group selection (or multi-level selection)	The development of cooperation within particular groups that are sufficiently impermeable that defectors are unlikely to arise in or enter the group
Mechanisms based on repeated interaction	
Direct reciprocity	Responding cooperatively to another's cooperative choice and responding noncooperatively to another's noncooperative choice; called direct reciprocity as it concerns direct responses to another's behavior
Reputation	The impression (or image score) that an individual forms about another person, which is often influenced by information provided by a third person who has had direct interactions with that person or has observed interactions involving them

3. Regard for Others

Do people cooperate for reasons beyond self-interest? The answer, as shown by a range of research, is yes. In fact, people will even cooperate in anonymous interactions with total strangers. In this area, recent research suggests the importance of three broad preferences:

- **Positive regard for others:** In a so-called single-trial social dilemma, most people will approach strangers cooperatively. In this game, two people simultaneously choose how much money to send to each other, knowing that any money transferred is increased by some multiplier. Most people choose to send either some or all of their money.

- **Positive regard for ingroups:** People have a strong tendency to allocate greater resources—for example, points or money—to their own group rather than to some other group. This is true even when the basis for ingroup versus outgroup categorizations is either trivial, such as preferences for famous painters, or randomly determined (Brewer, 1999; Ellemers & De Gilder, 2021).

- **Positive regard for equality:** Most people appreciate equality in outcomes and dislike outcomes involving inequality (Fehr & Schmidt, 1999; Van Lange, 1999). Egalitarianism is a basic human tendency, developing in children as young as three to eight years (Fehr et al., 2008).

COOPERATION CHALLENGES TODAY

Climate Change

Climate change can be regarded as one of the most complex social dilemmas imaginable. Two factors—abstractness and psychological distance—pose an enormous challenge to attaining and sustaining cooperation in climate change.

Abstractness is a problem because it readily translates into psychological distance—a cognitive state where people orient themselves both to practical matters in the here and now and also consider ideals for the future (e.g., Gilead et al., 2020). For example, consider the environmental impact of taking a trip on an airplane. It's difficult to envision the trip's ecological consequences, or to understand how flying can be detrimental to one's own country, let alone other countries, the continent, or the world.

> ***"Reputation-based cooperation occurs when what others know about an individual's past actions—for example, through direct observation or gossip—affects how they act toward that individual now."***

The abstractness of climate change derives from at least three sources of distance (Huckelba & Van Lange, 2020; Van Lange et al., 2018):

- **Distance in time:** Actions taken today may not have an impact on the climate for years, even decades. Also, those future results are uncertain and therefore difficult to predict.

- **Distance from the self:** Actions taken by an individual today may never affect that individual. Instead, the actions may affect climate change experienced by other individuals, groups or nations.

- **Distance from the ingroup:** The ingroup can be one's

household, community, organization, or even country. People often favor groups and collectives closer to the self than the rest of the world.

COVID-19

The COVID-19 pandemic is a massive societal challenge of unprecedented scale. It directly affects tens of millions of people around the world, substantially impacting the life of all humankind. In addition, the fact that COVID-19 is highly infectious lays the groundwork for its being a social dilemma: An individual's actions affect not only themselves, but also the health outcomes of others.

One thing that makes the COVID-19 crisis a particularly acute social dilemma is that there are substantial differences in risk among individuals. For many people, the individual benefit of avoiding infection is smaller than the individual costs associated with prevention behaviors. This creates a social dilemma: Will people who are at low risk incur the cost of COVID-19 prevention behaviors to reduce or avoid the collective risk of transmitting the disease to others who are more vulnerable?

What's more, COVID-19 involves multiple collectives, which in turn creates a multilevel social dilemma (Wit & Kerr, 2002). There are at least four distinct collectives to consider: family, community (friends, colleagues, neighbors, etc.), national, and international.

Misinformation

While misinformation isn't new, with the rise of social media, the way it gets disseminated is changing. As a result, there are widespread concerns about social media and the embrace of blatant falsehoods by political elites around the world (Lazer et al., 2018; Pennycook & Rand, 2021).

The crisis of misinformation is also a cooperation challenge. The societal ills generated by misinformation stand in tension with various individual benefits. Addressing misinformation requires an individual to bear personal costs. For one, there's the effort involved in assessing a message's accuracy. For another, there's the need to consider the accuracy of a message before sharing it with others (Pennycook et al., 2021). Finally, people who know a message is false can still derive benefits by sharing it. These benefits may include more traffic on social media, attracting new followers, and the like.

CONCLUSIONS

We believe that a comprehensive understanding of human cooperation is still needed. Scholars can rely on a productive combination of experimental research conducted in the lab as well as in the field.

The vast majority of research on cooperation has been conducted in lab settings, largely using economics games. This body of work has yielded fundamental insights into the drivers of cooperation. However, these insights are societally useful only inasmuch as they generalize to actual social dilemmas outside the lab. Especially in light of today's issues, it's essential for both theory and application that lab results be tested in the field.

> ***"Climate change can be regarded as one of the most complex social dilemmas imaginable."***

The three crises addressed in this article illustrate an important challenge for the near future: How do we apply insights from comparatively simple experimental settings to the complex social dilemmas of everyday life, so that we can understand these dilemmas and design successful interventions? We believe the field of human cooperation is in an ideal position to do this.

REPORT

The full research paper can be found **here**.

DISCLOSURE STATEMENT

David G. Rand has received research funding from Google and Meta for work related to misinformation. The authors are not aware of any other affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

ABOUT THE AUTHORS

Paul A. M. Van Lange is Professor of Social Psychology and chair of Social and Organizational Psychology at Vrije Universiteit Amsterdam. He's also a Distinguished Research Fellow at Oxford University.

David G. Rand is the Erwin H. Schell Professor and Professor of Management Science and Brain and Cognitive Sciences at MIT; director of the Applied Cooperation Team; and an affiliate of both the MIT Institute of Data, Systems, and Society (IDSS), and the MIT Initiative on the Digital Economy (IDE).

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MIT Initiative on the Digital Economy
MIT Sloan School of Management
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Cambridge, MA 02142-1347
617-452-3216
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