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Averting the Tragedy of the Commons

Using Social Psychological Science to Protect the Environment

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ABSTRACT—*Many local and global environmental challenges are tragedies-of-the-commons dilemmas in which private and collective interests are frequently at odds. Recent developments in social psychological theory and research suggest that in such commons dilemmas people are not just motivated by narrow (economic) self-interest but that they also consider the broader implications of their decisions for others and for the natural environment. Based on a core-motives analysis, I identify four necessary components for designing interventions to protect the environment: (a) information, (b) identity, (c) institutions, and (d) incentives, and discuss their utility and the feasibility of incorporating them.*

KEYWORDS—*commons dilemma; cooperation; core motives; environmental conservation; human evolution; social dilemma; social psychology; tragedy of the commons*

Don't it always seem to go
That you don't know what you've got till it's gone
They paved paradise
And put up a parking lot
—From the Joni Mitchell song "Big Yellow Taxi" (1970)

Within a short (evolutionary) time frame, *Homo sapiens* has become a global force dominating the natural world. Currently the human population worldwide amounts to 6.6 billion, and it is expected to rise to almost 9 billion by 2050. It is doubtful whether the Earth's ecosystems can sustain such large numbers, particularly at the current standard of living. Human activities are responsible for depleting natural resources, polluting the

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environment, and reducing biodiversity. Human-made environmental problems create economic and social conflicts with potentially devastating consequences for the health and well-being of ourselves and future generations. This is nothing new. Our species has had a long history of causing ecological destruction; yet due to a rise in population and technological know-how, these effects are now felt globally.

It is widely accepted that we need to move toward greater environmental sustainability. Yet making the necessary changes has proved very difficult, in part because there are conflicting interests between relevant parties (Dietz, Ostrom, & Stern, 2003). As the World Commission on Environment and Development (1987) recognized a while ago: "The Earth is one, but the world is not" (p. 27).

THE TRAGEDY OF THE COMMONS

The social dynamics underlying many environmental challenges are famously captured by Garrett Hardin (1968) in an article in *Science* titled "The Tragedy of the Commons," one of the most frequently cited works in the social sciences. The essay tells the story of how the management of a communal pasturage by a group of herdsmen turns into ecological disaster when each individual, upon realizing that adding extra cattle benefits him personally, increases his herd, thereby unintentionally causing the destruction of the commons.

The tragedy of the commons has become central to our understanding of many local and global ecological problems. As an evolutionary biologist, Hardin argued that nature favors individuals who exploit common resources at the expense of the more restrained users. He also argued that voluntary contributions to create institutions for managing the commons often fall short because of (the fear of) free-riders. To save the commons, Hardin therefore recommended "mutual coercion, mutually agreed

upon by the majority of the people affected" (Hardin, 1968, p. 1247).

The tragedy of the commons has generated much research activity in the behavioral sciences, from psychology to political science and from economics to biology. But despite its compelling logic, it has been criticized for two main reasons. First, scientists studying real-world environmental problems have found many instances of successful community-resource-management projects around the world, such as the maintenance of common agricultural land, irrigation systems, and lake and shore fisheries (Ostrom, 1990). Rather than a "free for all," these commons are strictly regulated in terms of access and intensity of use. A second more fundamental criticism concerns the validity of the assumption that commons users are driven exclusively by narrow (economic) self-interest. Although this is clearly an important motive, recent theoretical and empirical developments in social psychology, evolutionary biology, anthropology, and experimental economics suggest that individuals are not indifferent to the welfare of others, their group, or the natural environment. Using experimental game paradigms, such as the prisoner's dilemma, the public goods dilemma, or the commons dilemma (the latter is also known as the resource dilemma or common pool resource game), researchers have discovered myriad motives beyond self-interest that influence decision making in commons dilemmas (Weber, Kopelman, & Messick, 2004).

KEY STRATEGIES FOR PROTECTING THE ENVIRONMENT

In combination with field data, the experimental games literature suggests four key components of strategies for successful resource management: information, identity, institutions, and incentives. These four I's correspond, by and large, to four core motives for decision making in social dilemmas: understanding, belonging, trusting, and self-enhancing (for an overview, see Table 1). These motives are fundamental psychological pro-

cesses—likely shaped by evolutionary selection pressures—that influence our thinking, feeling, and behaving in social interactions (cf. Fiske, 2004).

Information
People have a fundamental need to understand their environment to predict what will happen in case of uncertainties. Environmental uncertainty tends to promote overuse because most users are optimistic about the future and underestimate the damage they are doing to the environment (Opotow & Weiss, 2000). Managing environmental resources therefore depends first and foremost on reliable information about the use and availability of resources like, for instance, drinking water, fossil fuels, and fish stocks. Science plays a vital role in reducing environmental uncertainty. Gathering reliable information is much easier when resources have clearly defined boundaries (e.g., land is easier to control than water or air).

Global environmental trends are highly complex and uncertain, which undermines effective behavioral change. In contrast, information about local environmental destruction is generally more persuasive, in part because the contingencies between actions and outcomes are easier to understand. A perceptible local resource threat such as an acute food or water shortage is an example. My colleagues and I conducted a survey among 120 households during the 1997 water shortage in the United Kingdom and found that the perceived severity of the shortage was positively associated with households' efforts to conserve water (Van Vugt & Samuelson, 1999). People's attributions of the causes underlying the water shortage made a difference. When people believed the shortage was caused by other households, they consumed more (and conserved less) water than when they believed it was caused by the weather. In addition, people made more efforts to conserve when they believed their own contribution made a difference in alleviating the crisis (cf. self-efficacy).

It appears that, when crafting messages to raise public awareness about environmental matters, simple information is

TABLE 1

Four I's: Core Motives and Foci of Interventions for Successful Commons Resource Management and Potential Constraints

Focus of intervention	Core motive	Description	Aim of intervention	Potential constraint
Information	Understanding	The need to understand the physical and social environment	Reducing environmental and social uncertainty	Global environmental problems are inherently uncertain.
Identity	Belonging	The need for positive social identity	Improving and broadening one's sense of community	Resource competition between communities increases overuse.
Institutions	Trusting	The need to build trusting relationships	Increasing acceptance of commons rules and institutions	Authorities are not always seen as legitimate and fair.
Incentives	Self-Enhancing	The need to improve oneself and increase one's resources	Punishing overuse and rewarding responsible use	Economic incentives undermine intrinsic motivation to conserve.

often most effective—particularly when decision makers are already contemplating changing their behavior. For instance, labels with comparative information about energy use and emissions of household appliances work best when consumers are already thinking "green" but lack specific technical knowledge. Environmental and social scientists must work more closely together to enhance people's understanding of environmental problems and to design public campaigns providing accurate information (Dietz et al., 2003).

Identity

As a group-living species, humans have a deep sense of belonging to social groups. Research suggests that people easily identify with and form attachments with other individuals in sometimes very large groups (Baumeister & Leary, 1995). The strength of their social identity affects how much people are willing to help their group or community, for instance in protecting the environment (Van Vugt, 2001). High-identifying group members sometimes even compensate for the resource overuse of fellow group members (Brewer & Kramer, 1986).

There are several ways in which people's identity and belongingness needs could be mobilized to foster proenvironmental action. First, people identify strongest with primary groups such as friends and family, and therefore an appeal to the interests of those groups will generally be more persuasive (e.g., "think of your children's future"). In addition, when people identify with a group, they are more likely to share costly environmental information (De Cremer & Van Vugt, 1999). For instance, in comparing lobster-fishing communities in Maine it was found that fishermen in communities with dense social networks exchanged catch information more frequently than did those in more loosely connected communities, resulting in more sustainable fishing (Penn, 2003).

Third, when people identify with a social group they are more concerned about their in-group reputation, and this can promote proenvironmental action (Hardy & Van Vugt, 2006; Milinski, Semmann, Krambeck, & Marotzke, 2006). Asking households to make a public commitment, for instance, reduces energy use by 20% (Penn, 2003). Providing households with normative social feedback—sticking a "smiley" or "frowney" face on their home energy bill when their energy use is less or more than the neighbourhood average—leads to similar reductions (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Finally, environmental pressure groups routinely, and with some success, apply reputation tactics in so-called "naming and shaming" campaigns to force polluting companies to change their policies.

Human belongingness needs are embedded within a marked in-group/out-group psychology. Many studies show that our social identities are boosted through inducing competition, either real or symbolic, between groups (De Cremer & Van Vugt, 1999). Yet creating intergroup competition in environmental dilemmas can be a double-edged sword. Resources that are shared between several communities, such as river irrigation systems or sea fisheries, are generally at greater risk of depletion (Ostrom, 1990). In such cases, it would be helpful to promote a superordinate social identity—for instance by promoting trade between the communities or by emphasizing a common threat such as the collapse of the local economy.

Institutions

A third condition for successful resource management is the presence of legitimate commons institutions. Authorities play a key role in governing local and global environmental resources, but who is prepared to trust and empower them? Institutions are essentially public goods that are in danger of being undermined by free-riders, individuals who profit from their existence but don't contribute to their upkeep. One way out of this dilemma is to appoint a leader or authority to regulate resource access (the Hardin solution). Yet this creates a second-order free-rider problem also known as the "who guards the guards" paradox: How can authorities be trusted to look after the common good (O'Gorman, Henrich, & Van Vugt, 2008)?

Trust is a core motive in social relationships (Fiske, 2004). Having confidence in the benevolence of other individuals and institutions lies at the heart of any collective effort to protect the environment. Commons users generally trust others to exercise voluntary restraint, but if institutional changes are necessary (e.g., during a resource crisis) they want leaders and authorities that can be trusted to look after the common good.

To get trust, authorities must employ fair decision-making rules and procedures. Regardless of whether people receive bad or good outcomes, they want to be treated fairly and respectfully. A study on the 1991 California water shortage (Tyler & Degoey, 1995) showed that Californians only cooperated with local water authorities in implementing drastic water-saving measures if they believed the authorities made efforts to listen to their concerns and provide accurate, unbiased information about the shortage. Moreover, procedural concerns were particularly important for residents with a strong sense of community identity. A survey on the 1994 British railway privatization found that train users who did not trust private companies to look after this public good were more likely to take a car instead (Van Vugt, Van Lange, Meertens, & Joireman, 1996). Thus, trust in institutions plays a crucial role in managing urgent and complex environmental challenges.

Incentives

There is no denying that many proenvironmental actions are driven by self-enhancing motives, notably the desire to seek rewards and avoid punishments. Monetary incentive schemes in the form of subsidies appear effective in fostering the adoption of home saving devices such as solar panels, water meters, and roof insulation. Financial incentives also promote sustainable practice within industry. In the United States, market-based

systems of tradable environmental allowances have become quite popular in recent years. This scheme permits companies to buy and sell "pollution" credits, and this system is believed to have contributed to a decline in acid rain (Dietz et al., 2003). Furthermore, in applying penalties for environmental damage, it seems better to start with a modest punishment and then gradually increase it after repeated violation, such as with catch quotas in fisheries (Ostrom, 1990).

The core-motives approach provides various novel insights into why particular incentive schemes might work better than others and why some might not work at all. First, not everyone is equally motivated by economic self-interest (Van Lange, De Bruin, Otten, & Joireman, 1997). In a water-conservation study, I asked households to complete a short community-identity scale (Van Vugt, 2001), with statements such as "I feel strongly attached to this community" and "There are many people in my community whom I think of as good friends" (1 = strongly disagree, 5 = strongly agree). Water records (corrected for various demographic variables and previous use) showed that households that identified strongly with their community did not need a financial incentive (through a metered tariff) to consume less water but those that weakly identified with their community did (see Fig. 1). This implies that economic incentives work better when other core needs are unfulfilled.

Second, interventions that fulfill various core motives simultaneously are likely to be most successful. The Van Vugt and Samuelson (1999) study showed that, during a shortage, conservation efforts were highest among households with a water meter, because having a meter both gave them a financial incentive to conserve (thus furthering their self-enhancement) and enhanced their knowledge about appropriate water-saving measures (thus furthering their understanding). Thus, metered households were better able to adjust their behavior during the shortage.

Third, incentive schemes might be counterproductive if they undermine other core needs. Handing out small fines for littering might signal that the problem is more widespread than it actually is (undermining the need for trust) or transform it from an ethical-environmental issue into an economic issue (altering the understanding of the problem; cf. Tenbrunsel & Messick, 1999). Particular incentive schemes might also create mistrust in authorities. When the Dutch government built a special lane for carpoolers in 1993 along one of the busiest highways in the Netherlands, it cut travel times substantially for car sharers. Yet single drivers reacted strongly against the lane, and after widespread protest and a legal challenge the lane closed within a year. Survey data suggested that many drivers did not trust the intentions of the authorities, and whereas some single drivers showed open resistance against the lane (by going to court to get access to it), others showed more subtle attitudinal shifts in favor of driving their car alone (cf. cognitive dissonance reduction; Van Vugt, Van Lange, Meertens, & Joireman, 1996).

CONCLUSIONS AND IMPLICATIONS

More research is needed to establish the interplay between these core motives in shaping environmental decisions. For instance, do people with strong community ties also have better knowledge of local environmental problems? Do sanctioning schemes enhance or undermine people's trust in commons institutions and in other users? Individual differences in core motives may also matter. We already know that environmental appeals are more persuasive among car drivers with cooperative dispositions (Van Vugt et al., 1996). Similarly, I suspect that people with high belongingness needs will be influenced more by community-based incentive schemes, whereas individuals with low belongingness needs might respond better to individual financial incentives. Also, we know very little about how these core motives change across the lifespan: Do people's belongingness needs become weaker or stronger as they grow older, and how do their social networks change? Finally, are there other central motives shaping people's decision making in commons dilemmas, such as autonomy or caring needs? We know that humans evolved on the savannah in Africa, and living in this environment may have endowed us with "biophilia" (Wilson, 2006), an innate tendency to enjoy and care for the natural world. Across cultures, people are attracted to the same savannah-type landscapes, and in both Europe and the United States, zoos attract more visitors annually than all professional sports events combined. Exposing children to enjoyable social outdoor experi-
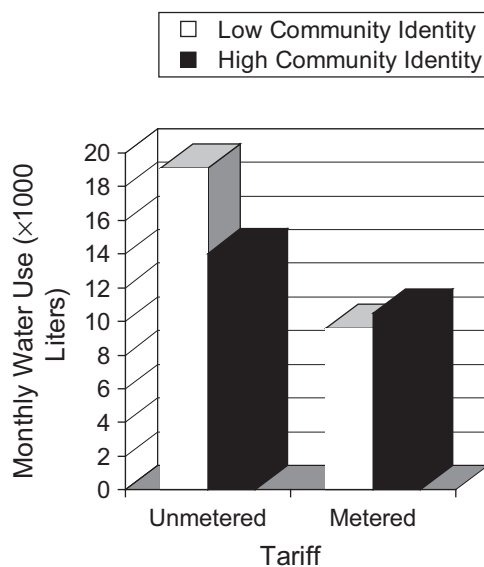

Fig. 1. Average monthly water use among a sample of 593 households in the United Kingdom in 1997 (data are corrected for income, household size, and pre-meter use). Water use varied between households as a function of tariff (metered vs. unmetered) and level of community identity (high vs. low). Adapted from "Community Identification Moderating the Impact of Financial Incentives in a Natural Social Dilemma: A Water Shortage," by M. Van Vugt, 2001, *Personality and Social Psychology Bulletin, 27*, pp. 1440–1449. Copyright 2001, Society for Personality and Social Psychology. Adapted with permission.

ences such as camping, trekking, or scouting may promote their lifelong environmental commitment. To develop these and other interventions to protect our environment and avert a commons tragedy requires a good understanding of human nature, which social psychology can provide.

Recommended Reading

Biel, A., Eek, D., Garling, T., & Gustafson, T. (2008). *New issues and paradigms in research on social dilemmas*. Berlin: Springer. A state-of-the-art review of contemporary research on social dilemmas.

Buunk, B.P., & Van Vugt, M. (2008). *Applying social psychology: From problems to solutions*. London: Sage. A manual for developing social interventions informed by social psychological theory and research.

Gardner, G.T., & Stern, P.C. (1996). *Environmental problems and human behavior*. Boston: Allyn & Bacon. A complete, highly accessible text about the human impact on the environment.

Ostrom, E. (1990). (See References). A classic book with case studies of commons resource management problems from around the world.

Van Vugt, M. (2001). (See References). A representative empirical study of a real-world commons dilemma, a water shortage.

REFERENCES

Baumeister, R.F., & Leary, M.R. (1995). The need to belong: Desire for interpersonal attachment as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529.

Brewer, M.B., & Kramer, R.M. (1986). Choice behavior in social dilemmas: Effects of social identity, group size and decision framing. *Journal of Personality and Social Psychology*, *3*, 543–549.

De Cremer, D., & Van Vugt, M. (1999). Social identification effects in social dilemmas: A transformation of motives. *European Journal of Social Psychology*, *29*, 871–893.

Dietz, T., Ostrom, E., & Stern, P.C. (2003). The struggle to govern the commons. *Science*, *302*, 1907–1912.

Fiske, S.T. (2004). *Social beings: A core motives approach to social psychology*. Hoboken, NJ: Wiley.

Hardin, G. (1968). The tragedy of the commons. *Science*, *162*, 1243–1248.

Hardy, C., & Van Vugt, M. (2006). Nice guys finish first: The competitive altruism hypothesis. *Personality and Social Psychology Bulletin*, *32*, 1402–1413.

Milinski, M., Semmann, D., Krambeck, H., & Marotzke, J. (2006). Stabilizing the Earth's climate is not a losing game: Supporting evidence from public goods experiments. *Proceedings of the National Academy of Sciences, USA*, *103*, 3994–3998.

O'Gorman, R.O., Henrich, J., & Van Vugt, M. (2008). Constraining free-riding in public goods games: Designated solitary punishers can sustain human cooperation. *Proceedings of Royal Society-B*, *276*, 323–329.

Opotow, S., & Weiss, L. (2000). New ways of thinking about environmentalism: Denial and the process of moral exclusion in environmental conflict. *Journal of Social Issues*, *56*, 475–490.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge, England: Cambridge University Press.

Penn, D.J. (2003). The evolutionary roots of our environmental problems: Toward a Darwinian ecology. *Quarterly Review of Biology*, *78*, 275–301.

Schultz, P.W., Nolan, J.M., Cialdini, R.B., Goldstein, N.J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, *18*, 429–434.

Tenbrunsel, A.E., & Messick, D.M. (1999). Sanctioning systems, decision frames, and cooperation. *Administrative Science Quarterly*, *44*, 684–707.

Tyler, T.R., & Degoey, P. (1995). Collective restraint in social dilemmas: Procedural justice and social identification effects on support for authorities. *Journal of Personality and Social Psychology*, *69*, 482–497.

Van Lange, P.A.M., De Bruin, E., Otten, W., & Joireman, J.A. (1997). Development of prosocial, individualistic, and competitive orientations: Theory and preliminary evidence. *Journal of Personality and Social Psychology*, *73*, 733–746.

Van Vugt, M. (2001). Community identification moderating the impact of financial incentives in a natural social dilemma: A water shortage. *Personality and Social Psychology Bulletin*, *27*, 1440–1449.

Van Vugt, M., & Samuelson, C.D. (1999). The impact of metering in a natural resource crisis: A social dilemma analysis. *Personality and Social Psychology Bulletin*, *25*, 731–745.

Van Vugt, M., Van Lange, P.A.M., Meertens, R.M., & Joireman, J.A. (1996). How a structural solution to a real-world social dilemma failed: A field experiment on the first carpool lane in Europe. *Social Psychology Quarterly*, *59*, 364–374.

Weber, M., Kopelman, S., & Messick, D.M. (2004). A conceptual review of social dilemmas: Applying a logic of appropriateness. *Personality and Social Psychology Review*, *8*, 281–307.

Wilson, E.O. (2006). *The creation: An appeal to save life on earth*. New York: Norton.

World Commission on Environment and Development. (1987). *Our common future*. Oxford, England: Oxford University Press.