



# Toward A Literacy of Cooperation

A new way of thinking across disciplinary boundaries is required to solve many social ills

1985

Involved with the WELL, a computer conferencing system

1990 - 1993

Editor Whole Earth Review

1994

Principal architect and Executive Editor of HotWired

1996

Founded and launched "Electric Minds"

## Books

Talking Tech and The Cognitive Connections with Howard Levine, 1982

Higher Creativity, written with Willis Harman, 1984

Tools for Thought: The History and Future of Mind-Expanding Technology, 1985

They Have A Word For It: A Light-hearted Lexicon of Untranslatable Words and phrases, 1988

Excursions to the Far Side of the Mind: A Book of Memes, 1988

Exploring the World of Lucid Dreaming , with Stephen LaBerge, 1991

Virtual Reality: The Revolutionary Technology of Computer Generated Artificial Worlds, 1991

The Virtual Community, 1993

Smart Mobs: The Next Social Revolution, 2002

## Biography

"Howard Rheingold sees things that others simply hadn't noticed before. And he knows how to explain why they are important and why you need to pay attention to them."

The Cyberanalyst by Sherry Turkle

Howard Rheingold, a guru of cyberspace and digital culture, has participated in and observed the usage of new technologies. He has been a pioneer, critic and forecaster of the impacts these technologies are having in causing new cultures and societies to evolve. In particular, he has examined how new social structures are effecting business, day to day life, freedom and social values both now and in the future. He is credited with inventing the term "virtual community."

A prolific author, he has 11 books to his credit, several that have been best sellers and were translated into French, German, Italian, Japanese, Spanish, and Swedish. His early activities as an author led to his involvement with the WELL, a computer conferencing system in 1985, where he continued writing about his life in a virtual community and subsequently authored more books about his experiences.

Becoming involved with the Whole Earth Review, he became its editor in 1993, and editor in chief of The Millennium Whole Earth Catalog. In 1994, he was one of the principal architects and the first Executive Editor of HotWired, but quit after its launch. In 1996, he founded and helped launch "Electric Minds".

He founded Howard Rheingold Associates in the early 1990s to provide consulting in building virtual communities. In 2005 he has been teaching a 10-week course at Stanford University on "A Literacy of Cooperation." The course is part of a long term investigation of cooperation and collective action undertaken in partnership with The Institute for the Future.

## Introduction

On March 17, 2005, Howard Rheingold was the SDForum Distinguished Speaker at the Palo Alto Research Center auditorium. Dressed in a colorful shirt and wearing personally painted shoes, he spoke with passion and enthusiasm about his insights and investigations into how technologies are causing new cooperative digital cultures and societies to evolve.

## Introduction

It is not hard to be a visionary, if you know how to look. If you visited PARC (Xerox Palo Alto Research Center) in the 1970s and saw what they were doing, as I did, it is easy to see where my visions of the future originated.



My purpose in coming here tonight is to enlist the audience in reshaping the ways in which we as a society get things done.

Theoretically we have viewed biology as war, a Darwinian conflict in which only the fittest survive. In war, we must destroy or conquer. In politics we must win at any cost. Instead, we propose a new paradigm of cooperation and complex interdependencies that fosters the power of collective interaction.

## Origins of Cooperation

Today's technologies and media have co-evolved over a very long time. Archeologists suggests that mankind started as nomadic hunters in small family groups. At times, these groups would join together to hunt bigger animals — you can't hunt a mammoth without banding together. We know that they were successful in doing this, since large mammals became extinct in North America after humans migrated into it.

Even a temporary larger group required a new social organization. When you kill a mammoth, you have more meat than the hunters can consume before it spoils. Humans are not able to store protein, yet they need a certain amount of it in their diet. So how are you going to allocate this excess meat? You need a

symbolic means of communicating who gets what.

As humans started to settle in rich agricultural areas, empires started to be created, that required large collective action. These empires required record keeping and were the genesis of primitive writing, resulting in the invention of the alphabet, six or seven thousand years ago.

Writing was the secret that allowed transmitting knowledge across time and space. It was restricted to few, who had power over the vast majority who were illiterate. It was the invention of the printing press, 500 or 600 years ago, that drove the Renaissance, where collective knowledge caused the transformation of science, religion, and politics.

The resultant spread of new ideas led to new forms of wealth and commerce. Capitalism was fundamentally enabled by the ideas of double entry bookkeeping and the concept of issuing stock.

Today, technology in the form of microprocessors and networks are enabling new social organizations.

## Prisoner's Dilemma

The Prisoner's Dilemma was formulated by the Rand Corporation as a mathematical strategy game:

- Two accomplices have been caught and placed in separate isolation cells. A prosecutor offers each, "You may choose to confess or remain silent. If you confess and your accomplice remains silent I will drop all charges against you and use your testimony to ensure that your accomplice does serious time. Likewise, if your accomplice confesses while you remain silent, they will go free while you do the time. If you both confess I get two convictions, but I'll see to it that you both get early parole. If you both remain silent, I'll have to settle for token sentences. If

you wish to confess, you must leave a note with the jailer before my return tomorrow morning.” The “dilemma” faced by each prisoner is that whatever the other does, each is better off confessing than remaining silent. But the outcome obtained when both confess is worse for each than the outcome they would have obtained had both remained silent.

This is a similar issue faced by rabbit hunters in deciding to join a stag hunt. They have to trust the other members of the group to cooperate with them in order to get the desired optimum outcome.

Robert Axelrod in “The Evolution of Cooperation” conducted a series of experiments in which the Prisoner’s Dilemma game was played repeatedly. He found that cooperation arises when the game is played over and over a long period, if the players involved have sufficient chance of meeting again. Repeat meetings lets individuals punish defection or reward cooperation that happened in earlier encounters.

In this situation, defecting each time is a poor strategy. Instead, the best strategy was tit-for-tat, where you always cooperate on the first exchange, then follow suit with whatever the other prisoner did on subsequent moves. While there are other strategies that can be even more optimal, tit-for-tat is an evolutionary stable strategy.

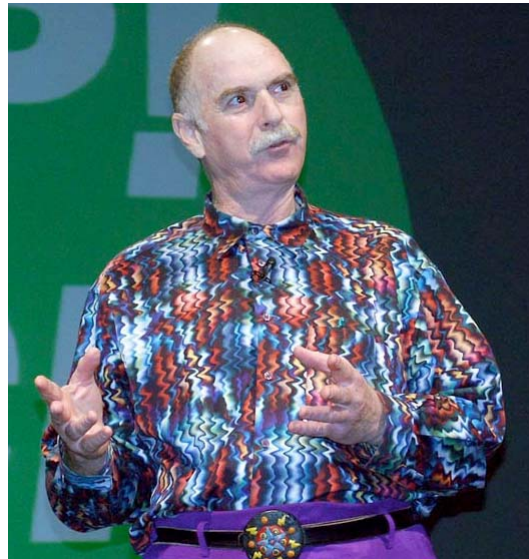
During the Cold War, there were only two superpowers, the United States and Russia. That the Prisoner’s Dilemma was known to both sides may account for how we avoided nuclear war for 60 years.

A Santa Fe Institute researcher found that in the Serbia civil war, that before the treaty was signed, both sides were responding similarly to the Prisoner’s Dilemma scenario.

## Ultimatum Game

Another interesting game is to give a player \$100. They can propose a split of the \$100 with a second player. If the second player re-

fuses, neither player gets any money. Thousands of trials were performed and it was found that most people refuse if the split is worse than 75% to 25%, and that most splits were close to 50% to 50%. Subsequently, they did this experiment with 50 different cultures, but they found that the results varied widely with culture. Whether a person was generous or stingy was highly dependent on their daily life conditions. But fundamentally, human culture appears to have a sense of fairness.



## The Tragedy of the Commons – Revisited

Garrett Hardin in his seminal 1968 article, “The Tragedy of the Commons,” observed that there are situations in which individually rational acts result in an outcome nobody wants for the society. Consider the Boston Commons where no one owns it, but everyone can graze on it. The result would seem to be that overgrazing despoils it and everyone loses.

Elinor Ostrom asked, “Does this really happen?” He found that while in many circumstances, the commons were ruined, but in many instances, over periods as long as ten, hundred, or thousands of years, common areas were effectively managed to benefit an entire group.

He found that when common areas were effectively managed, there were certain rules that

were agreed upon, and that when the areas failed, that these rules were absent:

1. **Clearly Defined Boundaries.** Define who is an insider and who is an outsider
2. **Congruence between Appropriation and Provision Rules.** You get what you work/pay for; or use of the common pool should be rationed based upon contribution.
3. **Collective Choice Arrangements.** Those affected by the rules should be involved in making the rules.
4. **Monitoring of resource condition and use** should involve the appropriators.
5. **Use Graduated Sanctions** for non-compliant behavior to foster compliance. Larger penalties for repeat offenses.
6. **Conflict Resolution Mechanisms** - Need to define rules in specific circumstances and to resolve different interpretations.
7. **Rights to Organize** - With widespread resources, broader authorities should permit appropriators of common pool resources to organize locally.
8. **Nested Enterprises** - successful large-scale common property regimes need to have rules and institutions that are nested and consistent.



## Importance of Cooperative Relations

Contrary to conventional Darwinian thinking, cooperative relations are important to ensure survival of organisms.

Furthermore, perhaps it is in our genes, but humans will pay to punish cheaters, it seems altruistic punishment is what holds society together. In situations where free riders get away with it, people will refuse to cooperate.

People are more likely to cooperate in an altruistic manner if they think they are being watched.

## New Forms of Cooperation in Industry

We are seeing new forms of cooperation in many high technology industries. Many industries have learned the value of working with their competitors to establish standards that help markets to grow and avoid costly standards wars.

New methods of industry cooperation are still evolving. Some of the experiments that are taking place involve collective knowledge-gathering, sharing economies, social software, prediction markets. The experiments that succeed will create new forms of wealth.

Here are examples of industry cooperation experiments:

- At **Toyota**, by teaching their production system to their suppliers, enables those suppliers to be more efficient not only to Toyota, but to all of their other customers.
- **Eli Lilly's** first e-business is Innocentive, a site that seeks to increase scientific collaboration by posting scientific problems that researchers will be rewarded for solving
- **Thinkcycle** provides a forum for designers and engineers to create open source designs for solving the problems of developing communities and the environment.

The open source movement showed that world-class software such as Linux and Mozilla

could be built without corporate oversight or market incentives.

- **Apple, IBM, and Sun** have made portions of their software open source, seeing it as a way of making their software more valuable.

Google and Amazon built fortunes by drawing on, even improving, the Internet by facilitating and building on the collective actions of millions of web publishers and reviewers.

- **Google** by providing a free forum for bloggers, is able to sell ads on the tens of thousands of blog sites it now hosts.
- **Amazon** has 60,000 stores using its software.
- **eBay** figured out how to make unsecured transactions work, where everyone fears a sucker payoff, by a feedback system, that while imperfect, works pretty well.
- **Wikipedia** lets anyone contribute to its free encyclopedia, with the result that it now has 1.3 million articles in 100 languages, contributed by over 13,000 active volunteers.
- **BitTorrent** solves the video distribution problem by causing everyone to become an uploader.
- Distributed computing is being used to solve very large problems such as protein folding (**folding@home**), and the search for extraterrestrial intelligence (**seti@home**). There are about 5 million volunteers contributing to SETI providing an estimated 37 TeraFLOPs/second of computing.

## Smart Mobs

A new form of cooperation enabled by mobile communication devices and pervasive computing technology is smart mobs. Low cost smart cellphones has enabled their widespread use, allowing users to access the Internet for information and to communicate with others both by instant messaging (SMS), email, and voice.

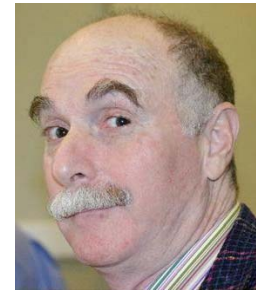
These technologies amplify the human talent for cooperation.

Street demonstrators in Seattle, WA in the 1999 anti-WTO protests used dynamically updated websites, cell-phones, and “swarming” tactics in the “battle of Seattle.”

A million Filipinos toppled President Estrada in Manila, Philippine through public demonstrations organized through salvos of cellphone text messages to coordinate their actions and evade barricades.

In Korea, citizens contributing to “Oh My News” via SMS cellphone messages, tipped the elections. In Madrid, political demonstrations occurred, organized in a similar manner.

But these self organizing mobs can turn nasty, as an example, in Nigeria the Miss World riots were all organized by SMS phones.



## Essential Elements

Technologies that facilitates cooperation do so by encouraging individuals to act in their self-interest while providing increased value to the group. The essential elements of cooperation promoting technologies are:

- Easy to use — can be used immediately
- Enable connections — what the individual creates can be accessed by anyone
- Open (anyone can participate or contribute)
- Group forming
- Self instructing (through imitation)
- Leverage self-interest — individual actions are of benefit to the group

## Summary

It was appropriate for Howard to be giving his talk at PARC, whose legacy he cited as being the promoting of multidisciplinary cooperation.

The 20th Century is a lesson in the dangers of social engineering. By learning from these lessons, we are gaining insights into systems that work, and we are now ready to start a new kind of thinking.

“... a people who mean to be their own governors must arm themselves with the power which knowledge gives.”

James Madison, entrance to the Library of Congress

Knowing more is better than not knowing, since we will make better decisions. Cooperative technologies help a group know more.

Many social ills can only be solved by developing new ways of thinking across disciplinary boundaries. We will be able to help alleviate suffering and create new wealth as computer scientists work together with sociologists and economists.

I call upon this audience to help us reshape the ways that we get things done in our society.

## Suggested Reading

“**Nature’s Magic : Synergy in Evolution and the Fate of Humankind**,” by Peter Corning, Director of the Institute for the Study of Complex Systems in Palo Alto, CA. The ‘Synergism Hypothesis’ asserts that synergy has also been a major causal agency in evolution; representing a unifying explanation for biological complexity. In essence it provides an ‘economic’ theory of complexity.

“**Net.Wars**,” by Wendy M. Grossman. Political groups have the power to do damage that formerly could only be done by nations. She examines the limitations of information security, Internet sex, hackers as villains and heroes, the conflict between privacy and law enforcement, and the debate between the Internet as

a level society and one that is intolerant of newcomers.

“**The Complexity of Cooperation**,” by Robert Axelrod uses the Prisoner’s Dilemma as the basis for showing how agent-based modeling can be used to social system properties such as coping with perception errors and how norms emerge.

## About the Author

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