







## How Science Can Enable a More Cooperative Future

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## What are the biggest problems we face today?



# What are the biggest problems we face today?

- Coronavirus pandemic
- Economic collapse
- Poverty and inequality
- Climate crisis
- ► War
- Pollution
- Political gridlock
- Authoritarianism
- Discrimination

- ► Food supply
- Crime
- Justice
- ▶ Education
- ► Transportation
- Health care
- Mental health
- Domestic violence

# We can achieve peace and prosperity in *our* lifetime

WHY CAN'T WE ALI JUST GET ALONG?





### But not how you might think...

- ► Not just via better technology...
  - (though we do need better tech stay tuned!)
- Not by electing "good leaders"
- Not by peace treaties
- Not by successful companies



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▶ ... but by people learning to become more cooperative with one another



## Most of today's social problems are due to a failure to cooperate

- The tradeoff between *cooperation* and *competition* is fundamental to solving society's problems
- ► Technological advances
  - ► *Increase* the value of cooperation
  - Decrease the value of competition
- ► Today's institutions are set up for *competition*:
  - Competition between products, companies in the economy
  - Competition between candidates, parties in government
  - ► Competition between nations, ethnicities, religions, etc. etc.
- ▶ How do we make our institutions more cooperative?

## Well, will people *ever* learn to cooperate with each other?

WHY CAN'T WE A

- Pessimist's answer: No
- Our answer: YES! (but it's gonna take some doing)
- What do you believe about "human nature"?
  - ► Intrinsic vs. Extrinsic Motivation
  - Scale up interpersonal and small-group cooperation

### Pessimistic scenarios imagine pouring tech into our present systems

- Capitalist or Socialist economics
- ▶ (US-style) Democracy (voting, parties, exec/legislative/judicial...)
- Nation-state international order
- ▶ ... but those systems were designed for *their* times: 18<sup>th</sup> and 19<sup>th</sup> centuries
- ▶ Let's redesign these systems for the 21<sup>st</sup> Century!

### The curriculum

- What keeps us from getting along?
  - ► Math, evolutionary theory
- Does human nature allow us to get along?
  - Psychology
- Can government help us get along?
  - ► Reasonocracy
- Can we get along economically?
  - ► Makerism
- ► What about...
  - **Education**, Transportation, Defense, Justice, etc. etc.

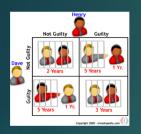


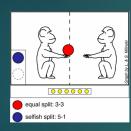
### Vicious and Virtuous Cycles



WHY CAN'T WE ALI JUST GET ALONG?

### Scarcity is the driver of competition



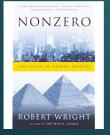


#### ▶ The Prisoner's Dilemma

 Mathematical model of the tradeoff between cooperation and competition

#### ▶ The Ultimatum Game

► Model of sharing of results of cooperative effort



#### ▶ Positive-sum Evolution

► Evolution selects for positive-sum outcomes





#### The Central Argument (1 of 7)

## The *tradeoff* between cooperation and competition determines whether our society will succeed or fail

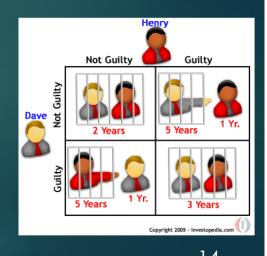




#### The Central Argument (2 of 7)

#### Many social situations can be described by the Prisoner's Dilemma.

It seems like you should *compete...* ... but actually, you should *cooperate* 





### The Central Argument (3 of 7)

Scarcity promotes competition

Abundance promotes cooperation

(and vice versa)

| Temptation    |
|---------------|
| Reward        |
| Punishment    |
| Sucker's Loss |

### The Central Argument (4 of 7)

Artificial Intelligence and Personal Manufacturing

can solve scarcity







#### The Central Argument (5 of 7)

Our political & economic systems were developed for competitive scarcity.

They must change for the new era of cooperation and abundance!



#### The Central Argument (6 of 7)

What replaces Capitalism/Communism?

*Makerism* (democratize the means of production)



#### Makerism

- ► Capitalism: *Capital* owns the means of production
- ► Communism: *Government* owns the means of production
- ▶ Makerism: *Everybody* owns the means of production
  - ▶ The means of production are:
    - ▶ 3D Printers and Robots, not big factories
      - ▶ Key advance: When a 3D printer can make another 3D printer
    - ► AI Software, not bureaucracies and bureaucrats





#### The Central Argument (7 of 7)

What replaces US "Democracy"?

## *Reasonocracy* (cooperation inspired by the social processes of science)



#### Reasonocracy

- Government inspired by the social principles of the scientific community
- Science is organized for cooperation
  - ▶ No President, No CEO
  - ▶ No stockholders, no political parties, etc. etc.
  - Very little voting



Modern processes and tools for achieving consensus

```
unfinished ? Is concrete better than carbon fiber?: most
refuted ? Yes its cheaper per pound.
con 1 ? Us but not cheaper per strength
folder(1) ? Why does this matter?
carbon is... ? carbon is 500x stronger, only 60x $
```





| Time                    | -100K years     |  |
|-------------------------|-----------------|--|
| Era                     | Hunter-Gatherer |  |
| Tech                    | Stones & Bones  |  |
| Economy<br>+ Government | Tribalism       |  |
| Interpersonal           | Competition     |  |
| Result                  | Blood           |  |

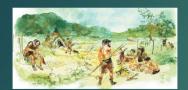






| Time                    | -100K years     | -10K years   |
|-------------------------|-----------------|--------------|
|                         |                 |              |
| Era                     | Hunter-Gatherer | Agricultural |
| Tech                    | Stones & Bones  | Plows & Cows |
| Economy<br>+ Government | Tribalism       | Feudalism    |
| Interpersonal           | Competition     | Competition  |
| Result                  | Blood           | Sweat        |







years to Now

| Time          | -100K years     | -10K years   | -100 years to |
|---------------|-----------------|--------------|---------------|
|               |                 |              |               |
| Era           | Hunter-Gatherer | Agricultural | Industrial    |
| Tech          | Stones & Bones  | Plows & Cows | Jobs & Mobs   |
| Economy       |                 |              | Capitalism    |
| + Government  | Tribalism       | Feudalism    | + Democracy   |
| Interpersonal | Competition     | Competition  | Competition   |
|               |                 |              |               |
| Result        | Blood           | Sweat        | Tears         |







-10K years

| Time                    | -10K y          |         |
|-------------------------|-----------------|---------|
|                         |                 |         |
| Era                     | Hunter-Gatherer | Agricul |
| Tech                    | Stones & Bones  | Plows   |
| Economy<br>+ Government | Tribalism       | Feudal  |
| Interpersonal           | Competition     | Compe   |
| Result                  | Blood           | Sweat   |

Agricultural Plows & Cows Feudalism

Competition



-**100 years to Now** Industrial Jobs & Mobs

Capitalism + Democracy

Competition

Tears



+10 to +100 years

Information Age Machines & Genes (AI & Robots & 3DP & Biotech)

Makerism + Reasonocracy

Cooperation

Peace, Prosperity



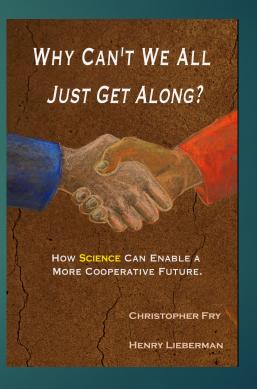
#### Now what should we do?

- Communicate an optimistic vision for the future
- ▶ Help people to understand that we're in a transitional society
- ► Help design the new society
- ► Help design the transition so that nobody gets hurt
- ... and we'll all live happily ever after!



## The full story with five part harmony and TEDx talk

- http://www.whycantwe.org
- ▶ Book (e-book and hardcopy)
- ► TEDx talk (12 minutes), essays
- ► You are invited to our MIT course!
  - ▶ RSVP: <u>lieber@media.mit.edu</u>
  - ▶ Mon and Wed, 2 Sept 2020 14 Dec 2020
  - ▶ 15:00-16:30 US EDT = 19:00-20:30 UTC



### Mailing Lists

#### ► Two mailing lists for this course:

#### ► <u>scicoop-fall-2020@mit.edu</u>:

- ► All participants plus instructors
- **Everyone may post** -- we encourage general questions / class-wide discussion!
- ► Course announcements will be sent by instructors

#### scicoop-fall-2020-staff@mit.edu:

- ▶ Just goes to course staff (Instructors Henry + Fry / TA's Esther, Blake)
- ► Submit homework here (for now)
- ► Ask private questions to the instructors

