Workshop on Sociophysics: Social Phenomena from a Physics Perspective

THE DESTRUCTIVE EFFECT OF HUMAN STUPIDITY <u>A revision of Cipolla's fundamental laws</u>

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THE FOUR GROUPS

All human beings are included in four fundamental categories

The intelligent: The intelligent person knows that he's intelligent.

The bandit : The bandit is aware to be evil.

The naïve or helpless: The naive is painfully imbued with the sense of his own candor.

The stupid : The stupid doesn't know to be stupid. This contributes to give greater strength, incidence and effectiveness to his devastating action. The stupid is not inhibited by self-consciousness

FIRST LAW

Always and inevitably, each of us underestimates the number of stupid individuals in the world



SECOND LAW

The probability that a certain person is stupid is independent of any other characteristic of the same person

Cipolla was convinced that stupidity was another characteristic, like hair or eyes color. Therefore, it's distributed in all circles of society in a more or less similar proportion. The distribution of stupidity is uniform, no matter how much we ascended in the educational level.

THIRD LAW

A stupid person is one who causes harm to another person or group without at the same time obtaining a benefit for himself or even damaging himself

Cipolla didn't consider stupidity a matter of intellectual quotient, but rather a lack of relational intelligence.

He started from the idea that relating to each other we can obtain benefits for ourselves and for the others or, on the contrary, cause harm to ourselves and to the others. A stupid person is one who harms the others and also himself.

"There are people who, with their unlikely actions, not only cause harm to other people, but also to themselves. These people belong to the superstupid genre".

FOURTH LAW

Non-stupid people always underestimate the harmful potential of stupid people

According to Cipolla, we continually forget the danger that stupid people represent "Stupid people are dangerous and unfortunate because reasonable people find it difficult to imagine and understand a stupid behavior."

Generally their attack takes us by surprise and even when we suffer it, we find it difficult to organize a rational defense because the attack itself lacks rationality. By underestimating their power, we remain vulnerable and, therefore, at the mercy of their unpredictability.

We can also fall into the error of thinking that a stupid person can only hurt himself, that we're immune to his actions, but with thinking this way we confuse naivety with stupidity and, believing ourselves invulnerable, we lower our defenses.

FIFTH LAW

The stupid person is the most dangerous person that exists

Corollary

A stupid person is more dangerous than a bandit

Intelligence and stupidity are not the opposite of one another. Stupidity is not the lack of intelligence

"No one is intelligent enough to understand their own stupidity" (Matthijs van Boxsel, Encyclopedia of stupidity

FOUR PHENOTYPES

The intelligent person's actions benefit both himself and others.

The bandit benefits himself at others' expense.

The helpless or näive person's actions enrich others at his own expense.

The stupid person's action harm to another person without obtaining a benefit for himself or even damaging himself





FOUR PHENOTYPES



Players interact between them (in pairs) and in each interaction there is an effect upon themselves and their mates.

Two parameters: *p*: the gains or losses that an individual causes to him or herself *q*: the gains or losses that an individual inflicts on others

Strategies: Each of the four phenotypes I,B,S,H

I :
$$p_i > 0$$
 and $q_i \ge 0$,

B : $p_b > 0$ and $q_b < 0$,

S : $p_s \le 0$ and $q_s < 0$,

H : $p_h \le 0$ and $q_h \ge 0$.

Payoff matrix

 $\begin{pmatrix} p_{i} + qi & p_{i} + qb & p_{i} + qh & p_{i} + qs \\ p_{b} + qi & p_{b} + qb & p_{b} + qh & p_{b} + qs \\ p_{h} + qi & p_{h} + qb & p_{h} + qh & p_{h} + qs \\ p_{s} + qi & p_{s} + qb & p_{s} + qh & p_{s} + qs \end{pmatrix}$

 $p_b + q_i > p_i + q_i > p_b + q_b > p_i + q_b \rightarrow \text{subgame (I,B) is PD}$

 $q_b < 0$ and $q_i > 0 \rightarrow$ It is enough to choose $p_b > p_i$

Why? Later...

Mean field (replicator) equations

$$\dot{x_k} = x_k (p_k - \sum_j x_j p_j)$$

x_k is the fraction of players with strategy k, with k=i,b,h,s

The q_k can be ignored due to a property of the replicator equation.

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These equations have only one stable equilibrium corresponding to the survival of the bandits

The Nash equilibrium of the game is being a bandit

On networks



Three dynamics

- 1. Rational imitation
- 2. Specific imitation
- 3. Probability of occasionally being stupid

p_i	p_b	p_h	p _s	q_i	q_b	q_h	q _i
1	[1.1, 2]	[-2, -1]	[-2, -1]	1	-1	1	-1

Mean profit
$$\langle \epsilon \rangle$$

Ratio between L and B ρ_I / ρ_B

Rational imitation

After each round each player imitates the best neighbour.



 π_d Network disorder

 $ho_s(0)$ Initial S players

Specific imitation

Each strategy has an imitation dynamics:

S : the higher payoff I : the higer global payoff without los H: the higer global payoff S: Remains S



Intermittent stupidity

After each round each player imitates the best neighbour.



 ρ_s probability of playing S

 π_d Network disorder

 $w_f(\pi_d)$ width (0.1-0,9)

Intermittent stupidity

 $\rho_s^{0.5}(\pi_d) = 0.429 - 0.163 \exp(-4.996\pi_d)$

 $w_r^{-1}(\pi_d) = 0.2 + \frac{5.810^{-3}}{7.310^{-3} + \pi_d}.$



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$$\xi(\rho_s, \pi_d) = w_r(\pi_d)(\rho_s - \rho_s^{0.5}(\pi_d)).$$

$ho_s\,$ probability of playing S

CONCLUSIONS

Cases 1 and 2

Even the smallest fraction of stupid people produces a notable effect, as the fifth law establishes, a stupid person is the most dangerous, even more dangerous than a bandit.

We found some exceptions where the (S) group seems to exert contradictory effects favoring the propagation of (I) players and leading to a higher mean profit.

This phenomenon is the result of a screening effect played by the (S) population, as they isolate the (I) players from the (B) ones avoiding the tempting change from (I) to (B).

At the same time, during the transient presence of (S), the (I) group strengthens and may start to propagate towards the (B) population. At this point, the (S) populations starts to play the opposite role, as it prevents the (I) group from advancing over the (B) population.

CONCLUSIONS

Intermittency

The results show the existence of a crossover between two regimes.

The transition from the cooperative regime to the defective one is only sharp for slightly disordered networks, turning smoother as the disorder increases. Also, the increasing disorder produces a displacement of the values of s promoting the cooperative behavior to higher values.

The curves show that while for low values of (S) the disorder attempts against (I), the situation is reversed for the highest degrees of disorder.

This phenomenon can be attributed to the mentioned screening effect played by the (S) population.

It is possible to collapse all curves

