A photograph of a narrow canal in a ghetto area. The canal is filled with water, reflecting the surrounding buildings and laundry. On the left, there are several boats covered with green tarps. On the right, there are buildings with brick walls and windows. Laundry, including blue and white clothes, is hanging across the canal. The overall scene depicts a densely populated, narrow waterway.

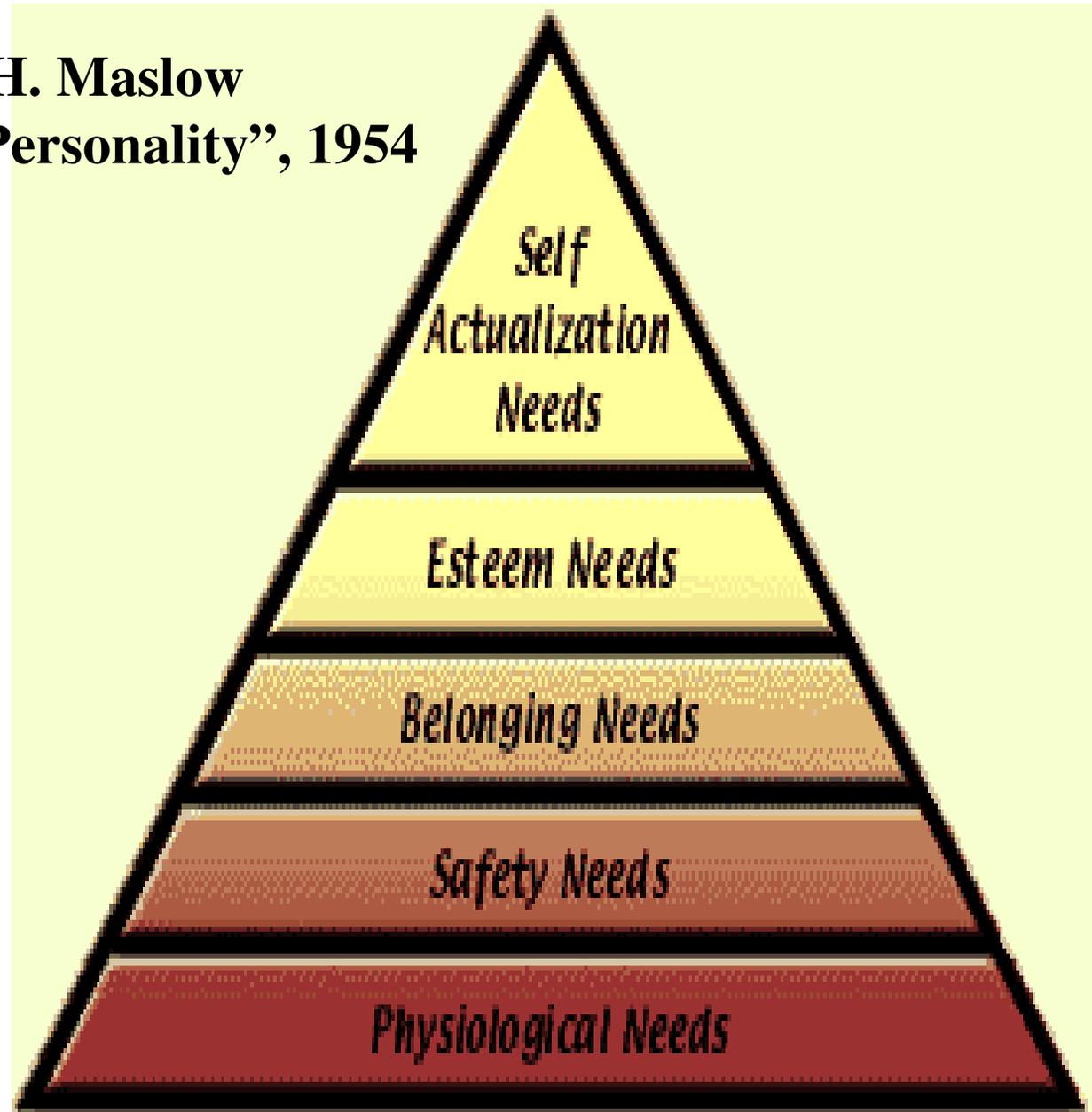
NEEDS AND DECISIONS IN GHETTO

**Krzysztof Kułakowski
AGH-UST, Kraków,
Poland**

overview

- 1. MASLOW THEORY OF NEEDS**
- 2. FROM AN ISSUE TO THE DECISION TREE**
- 3. WHAT I MEAN BY 'GHETTO'**
- 4. ISSUE OF RESISTANCE**
- 5. THE SAFETY LEVEL**
- 6. MEAN FIELD APPROACH**

Abraham H. Maslow
„Motivation and Personality”, 1954



Example of satisfaction of needs:

10 %



50 %

40 %

85 %

70 %

Two conjectures:

$$\text{satisfaction} / \text{effort} = \text{payoff} < 1$$

$$\text{effort at level } (n+1) = \text{satisfaction at level } (n)$$

Then in our previous example of satisfactions (85%, 70%, 50%, 40%, 10%)
the **payoffs** are:

0.85 (physiology)

15% of effort lost

0.7 / 0.85=0.82 (safety)

0.18*0.85=15% of effort lost

0.5 / 0.7=0.71 (belongingness)

0.29*0.7 =20% of effort lost

0.4 / 0.5=0.80 (esteem)

0.20*0.5 =10% of effort lost

0.1 / 0.4=0.25 (self-actualization) remaining 40% of effort

provided that all that remains of effort has been made at all levels.

We know WHAT people do. Now, HOW they do it?

For a given issue, we can construct the **decision tree**:

how individual needs are translated to decisions about the **issue**?

Example: **issue of conformism** (*practice of "going along and getting along" with people who appear to be more powerful*).

The quest should be: in given conditions (payoffs),
how people struggle for satisfaction of their needs?
How their efforts are coherent with our **issue**?

Can one get: **safety** being a conformist ?

For a given issue, we can construct the **decision tree**:

how individual needs are translated to decisions about the **issue**?

Example: **issue of conformism** (practice of "going along and getting along" with people who appear to be more powerful).

The quest should be: in given conditions (payoffs),
how people struggle for satisfaction of their needs?
How their efforts are coherent with our **issue**?

Can one get: **belongingness** being a conformist ?

For a given issue, we can construct the **decision tree**:

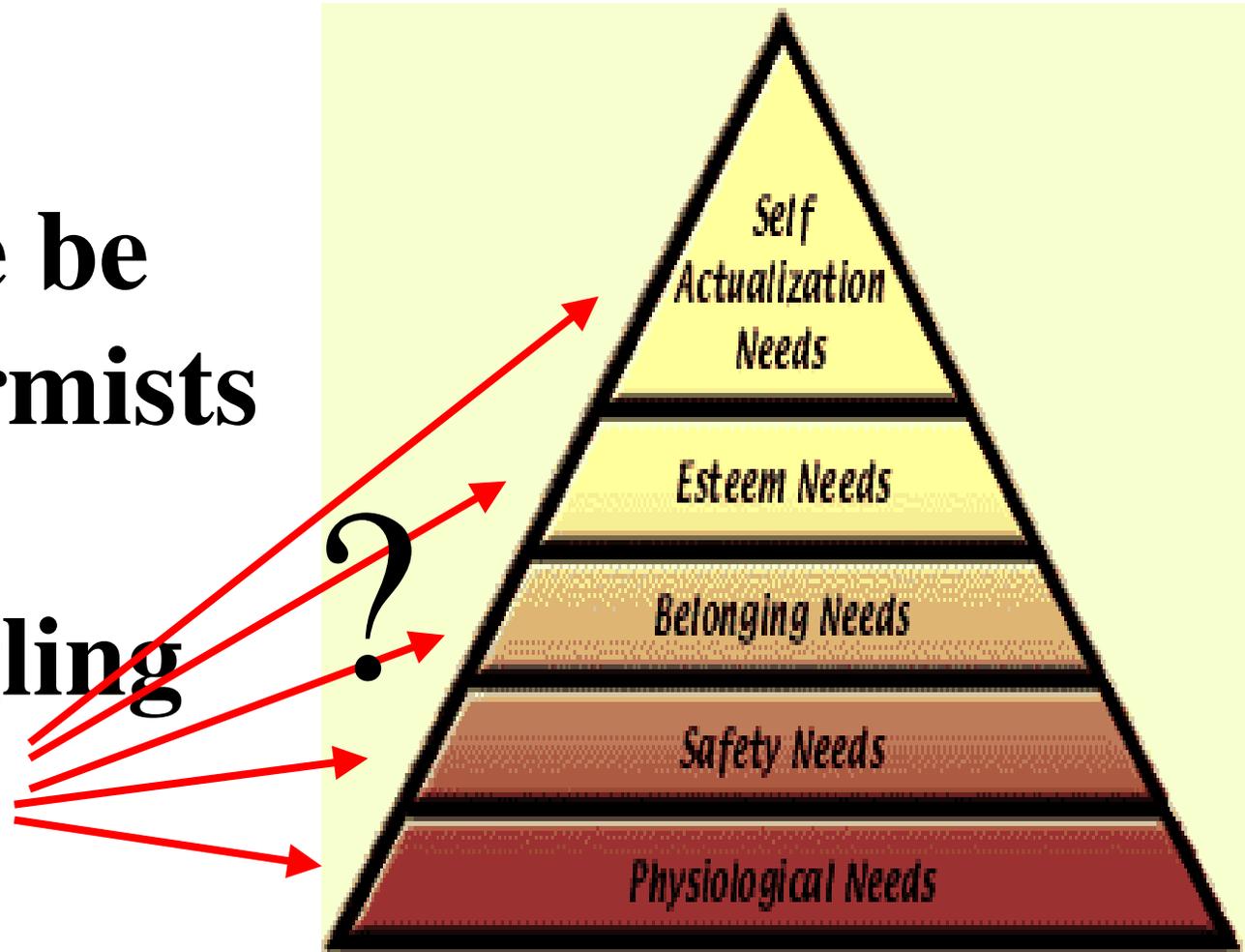
how individual needs are translated to decisions about the **issue**?

Example: **issue of conformism** (practice of "going along and getting along" with people who appear to be more powerful).

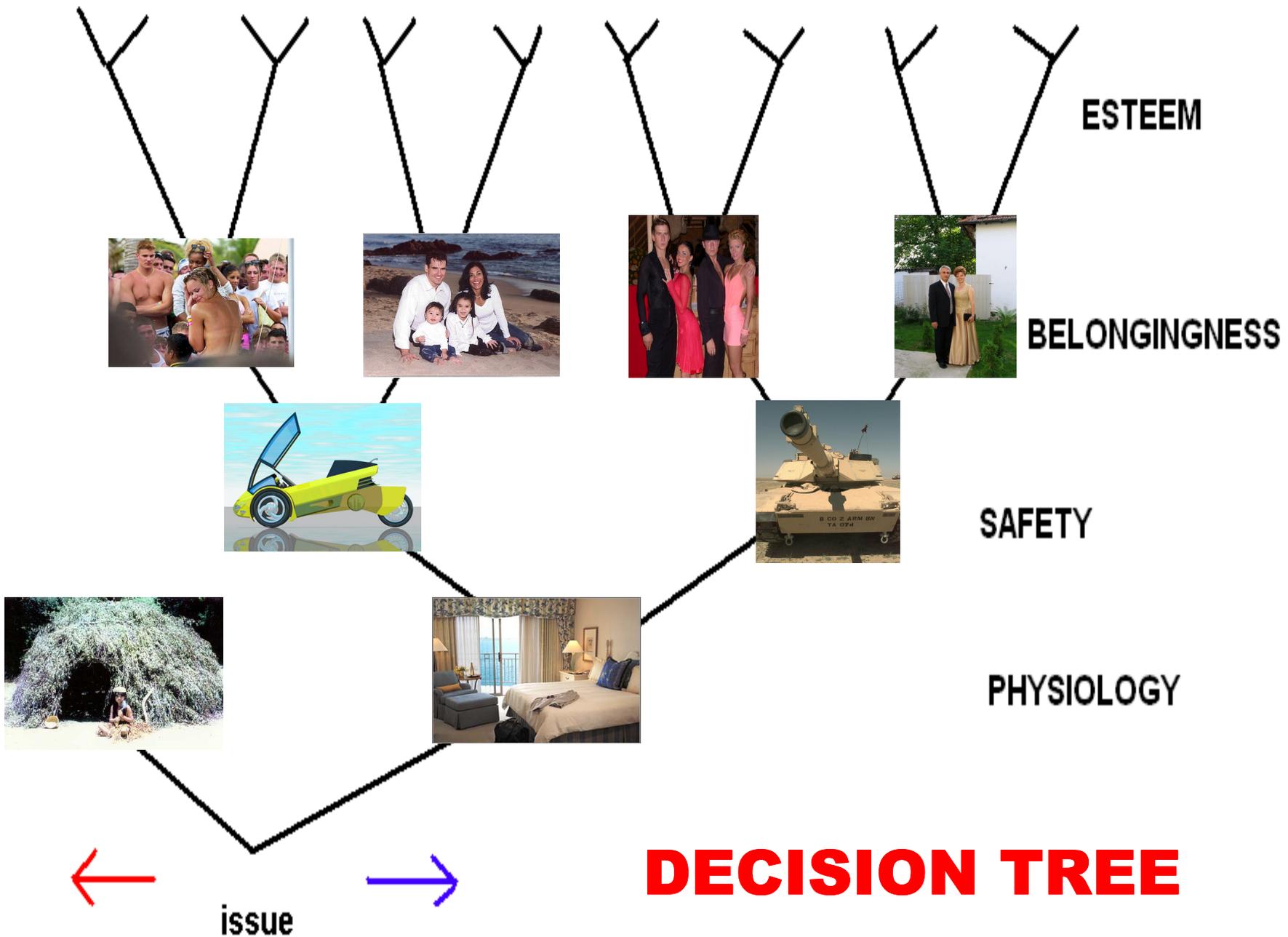
The quest should be: in given conditions (payoffs),
how people struggle for satisfaction of their needs?
How their efforts are coherent with our **issue**?

Can one get: **esteem** being a conformist ?

Or: **will**
people be
conformists
when
struggling
for:



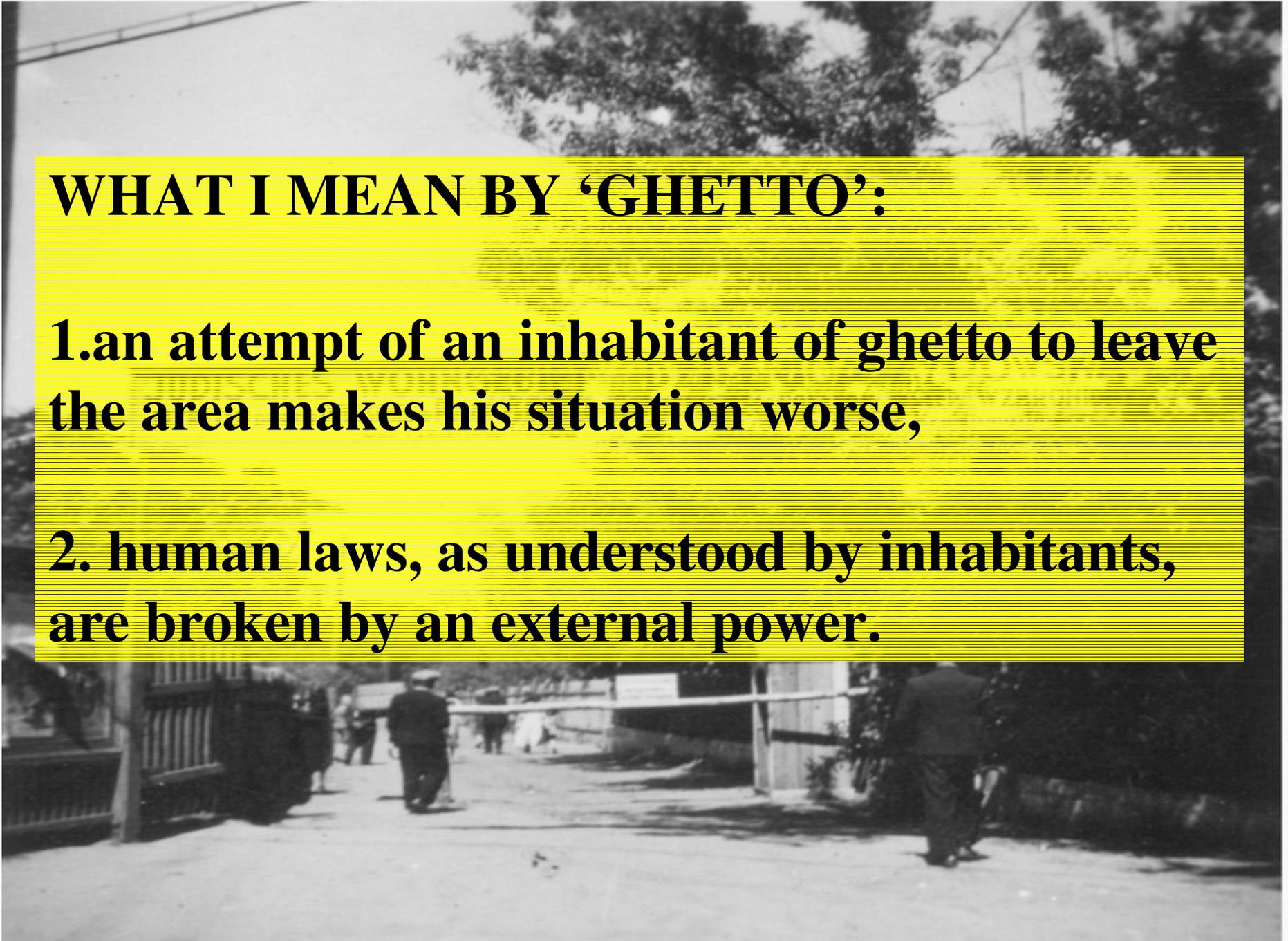
taking given values of payoffs into account



WHAT I MEAN BY 'GHETTO':

1. an attempt of an inhabitant of ghetto to leave the area makes his situation worse,

2. human laws, as understood by inhabitants, are broken by an external power.





Guatemala?



Soweto



Riga?



Lodz



Sarajevo



Baghdad



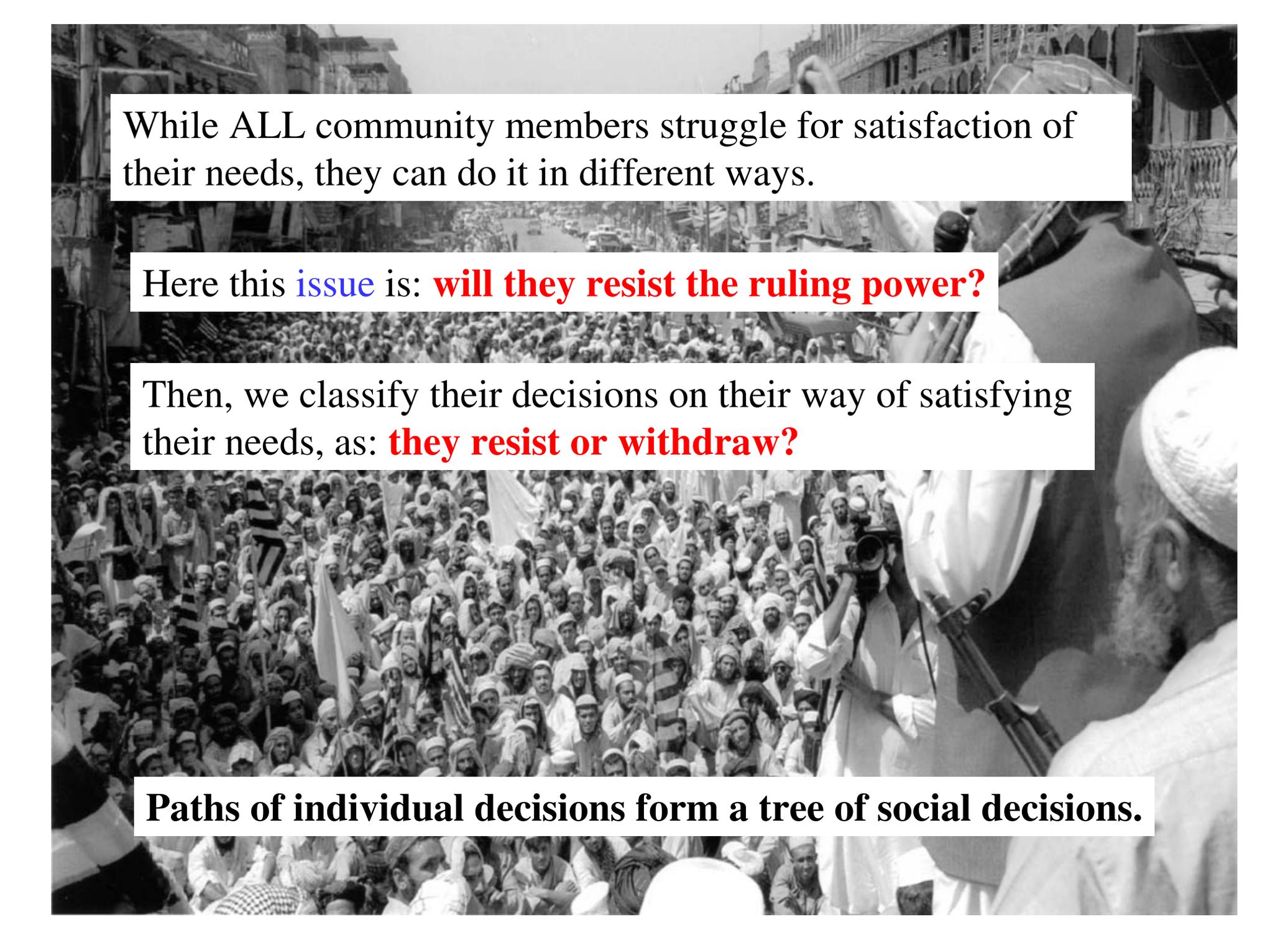
Grozny



Marseille?



Ramallah



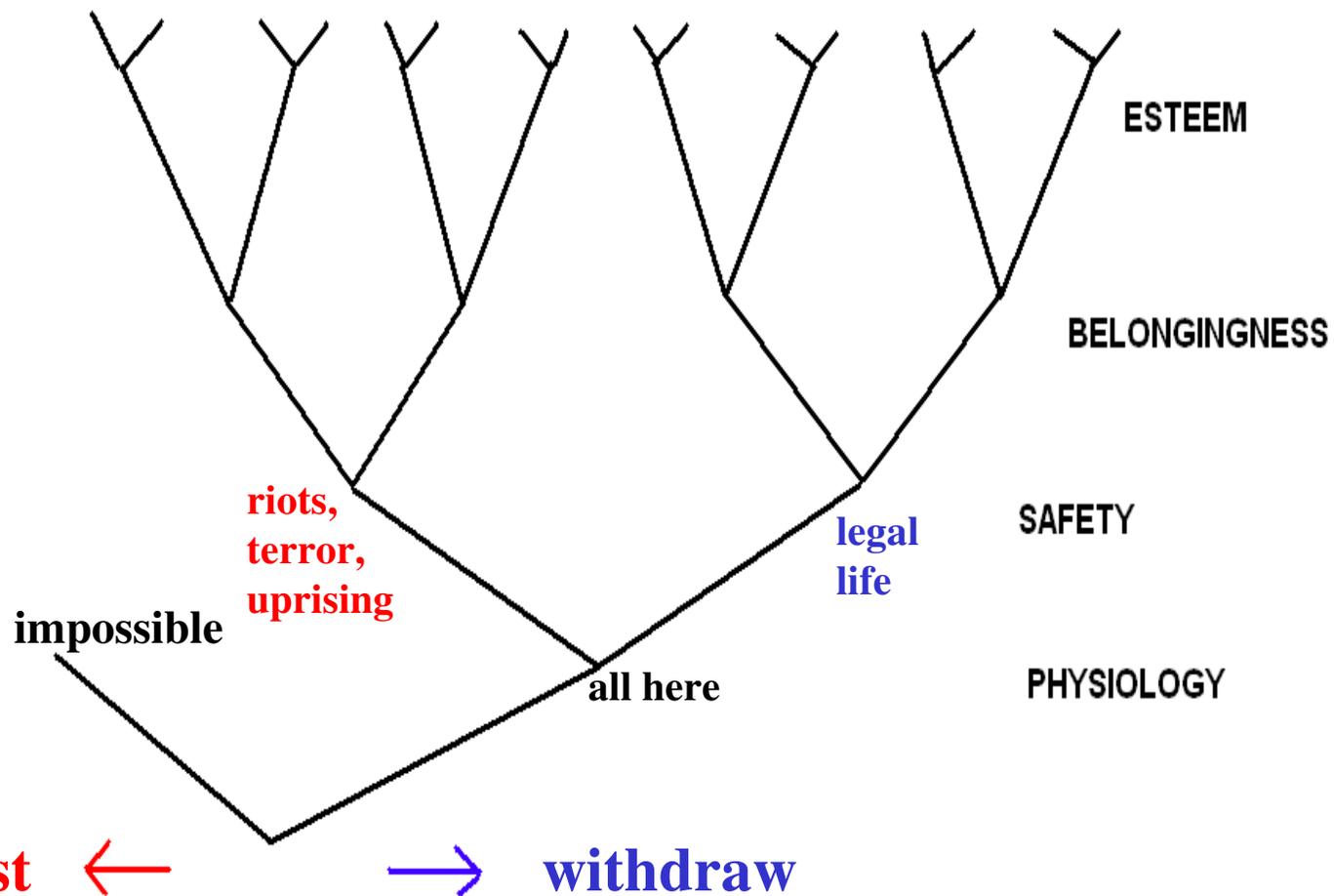
While ALL community members struggle for satisfaction of their needs, they can do it in different ways.

Here this **issue** is: **will they resist the ruling power?**

Then, we classify their decisions on their way of satisfying their needs, as: **they resist or withdraw?**

Paths of individual decisions form a tree of social decisions.

The issue of resistance in ghetto.





SAFETY

PHYSIOLOGY



SAFETY

PHYSIOLOGY

EFFORT=X
PAYOFF=Y
SATISFACTION=XY<X

EFFORT=X
PAYOFF=Z
SATISFACTION=XZ<X

SAFETY

PHYSIOLOGY

EFFORT = 1
PAYOFF = X
SATISFACTION = X

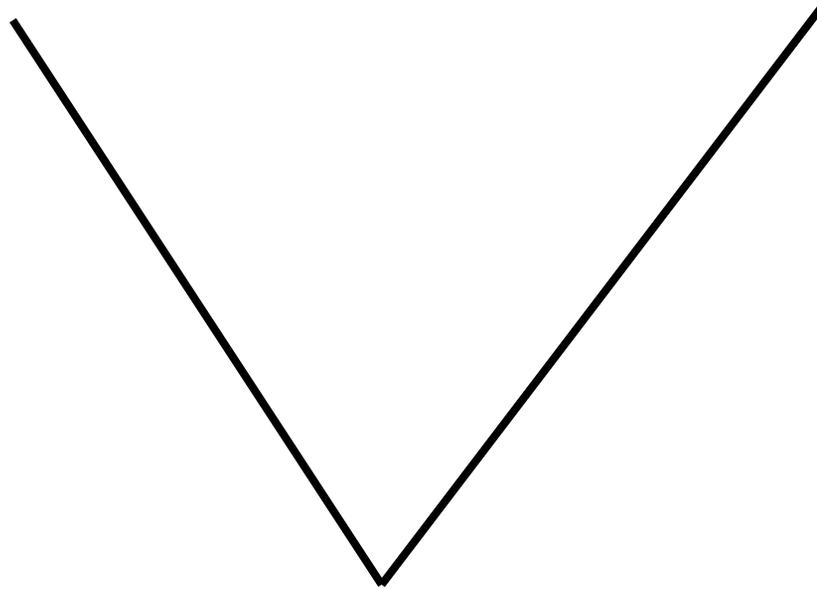
The question is: $Y < Z$?

Another question: do people know on the payoffs?

MAGNETIC ANALOGY

Resist (R) = spin up

Withdraw (W) = spin down

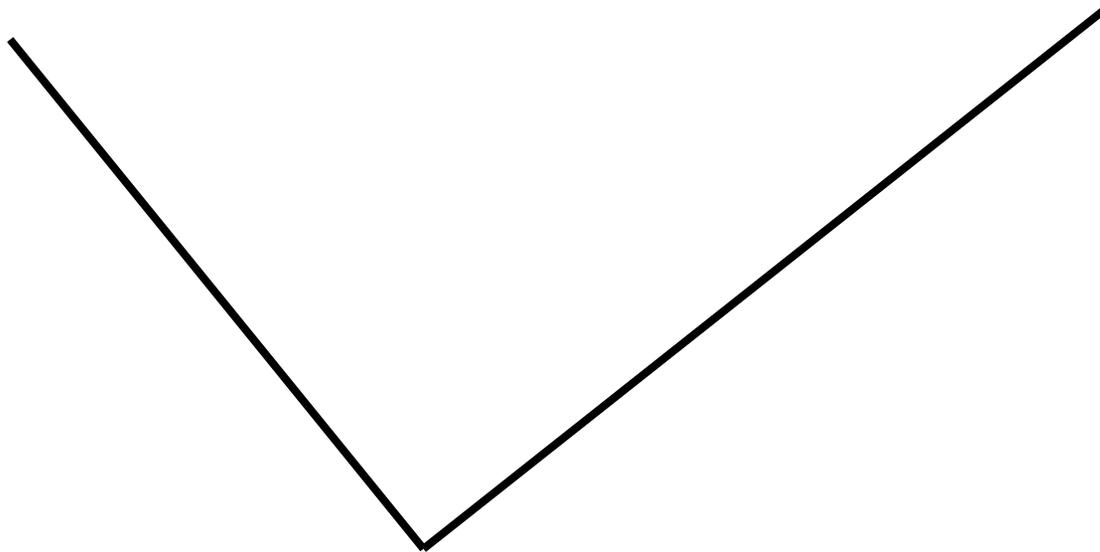


**Lack of information about the actual decisions at social scale
= temperature T**

MEAN FIELD APPROACH

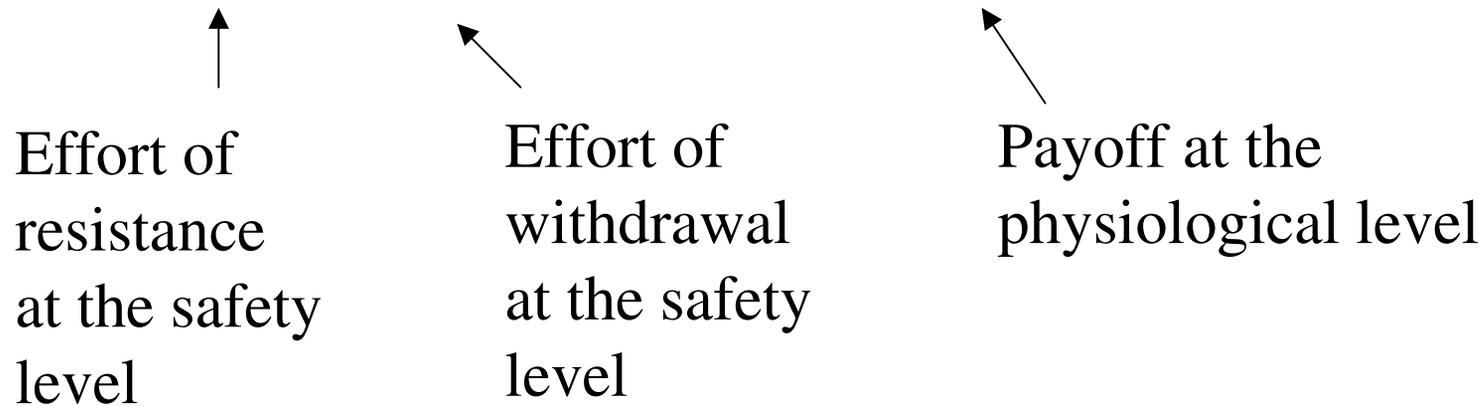
Effort(R) \propto payoff(R)
 \propto number of resistants

Effort(W) \propto payoff(W)
 \propto number of withdrawn



Essence of the phase transition: **POSITIVE FEEDBACK**

$$\mathbf{Effort(R) + Effort(W) = Payoff}$$



$$\mathbf{Effort(R) - Effort(W) \equiv m \Rightarrow Effort(R,W) = (Payoff \pm m)/2}$$

$$\mathbf{dm/dt = (Payoff - m) w(W \rightarrow R) - (Payoff + m) w(R \rightarrow W)}$$

where $w(W \rightarrow R) = \exp(m/T)$ **(mean field theory)**

$$\frac{dm}{dt} = Payoff * \sinh(m/T) - m \cosh(m/T)$$

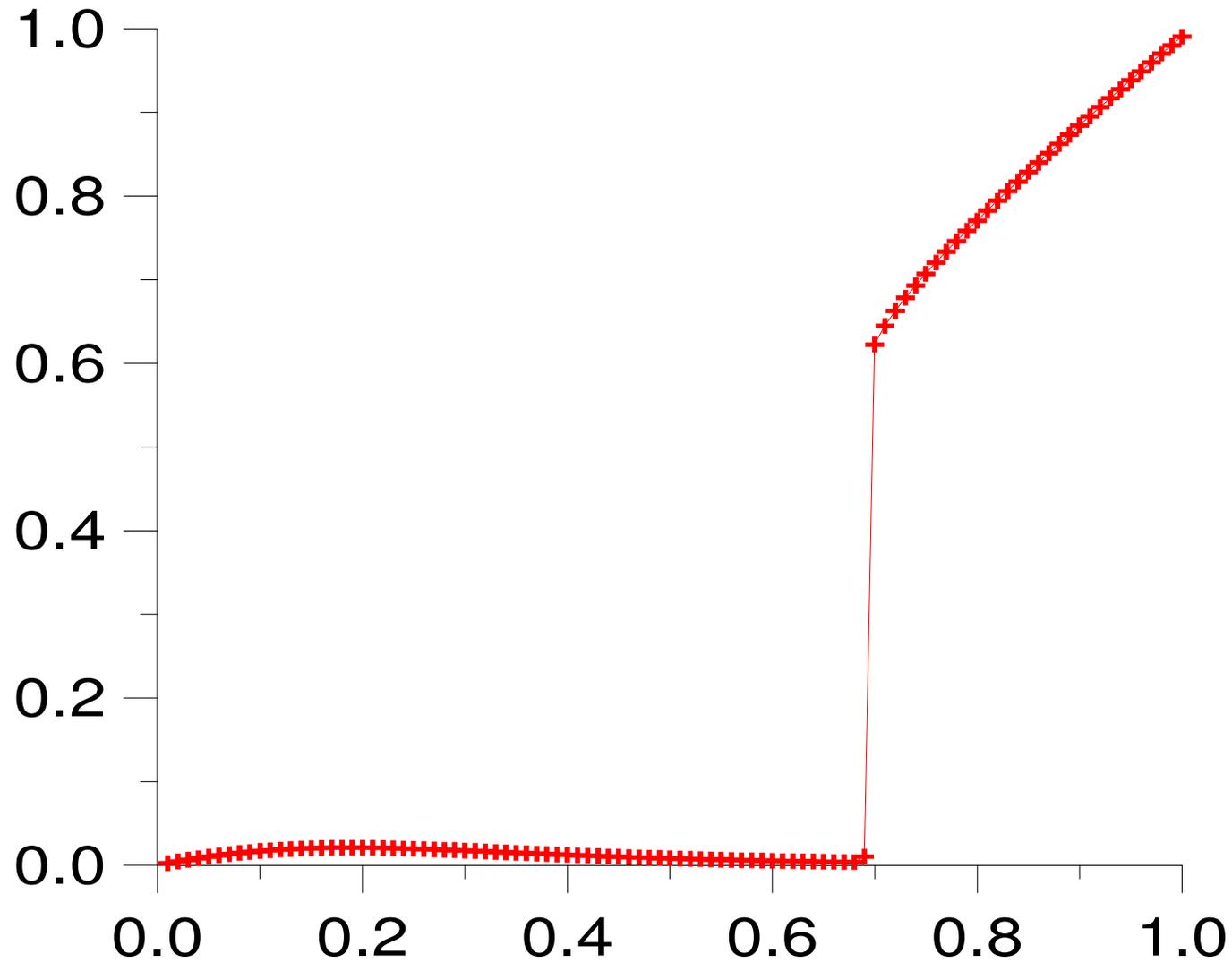
Question: how to reduce the resistance?

Two solutions:

A. Provide safety for the inhabitants (it cannot be done by army). Then the payoff of the resistance fighters is much less than the payoff of the others.

B. Reduce the payoff at the physiological level (this can be done by army). Then the whole population is concentrated on their physiological needs: food, water, medical treatment.

effort at resistance at the safety level



payoff at the physiological level



SAFETY

PHYSIOLOGY

CONCLUSION



**ONCE THE SAFETY IS INVADED,
A COMPLEX MACHINE OF SOCIETY IS
TRANSFORMED INTO A SIMPLE
RESISTANT MEDIUM**



Thanks to

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- Dietrich Stauffer for criticism (the only conscious)

More details in

K.Kułakowski, physics/0512058 ;Int. J. Mod. Phys. **C17** (2006) 287