

Vulnerability and Solidarity
(Carlo Jaeger, 25th September 2003 in Peyresq)

0. Introduction: Two themes will be of particular importance throughout this lecture: First, a line of thinking related to vulnerability and solidarity and second, a questioning of the tendency to express everything in numbers. The intention is to carefully flag where a formalized, quantifying approach makes sense and where it doesn't.

1. Vulnerability of Regions and of People

1.1 Vulnerability of Regions

Different regions are differently vulnerable. This becomes clear if one invites people from region A to visit region B and vice versa, and observes their willingness to follow the invitation. The following examples for regions were suggested by the audience: The Sahel zone (1), the Mediterranean (2), the Arctic (3), the Amazon (4), the Atlantic Ocean (5), Europe (6), and Southern Africa (7). One may arrange these regions into a matrix and carry out a subjective estimation of the comparative vulnerability of each pair of regions given by the row and column intersecting in each point:

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Region 1							
Region 2							
Region 3							
Region 4							
Region 5							
Region 6	<6/1>	<6/2>	<6/3>	<6/4>	<5/6>	/	<6/7>
Region 7							

The (exemplary) table illustrates the audience's perception or estimation that Europe is less vulnerable than all the other regions with the exception of the Atlantic Ocean (region 5).

Relations are something that human beings are used to employ in their thinking. This does not mean, however, that there is a numeric value for every relation – for instance, how would one express the relation between a mother and her daughter through numbers? Also, it is not clear whether a relation such as given by the above table will lead to an ordering. If we take the example of soccer teams, the relation given by one team's victory over a second team is not necessarily transitive (which is one of the conditions for the existence of an ordering). If we carry out a pairwise comparison of regions' vulnerability we may not always get a clear conclusion. Most likely we will find several regions of maximal vulnerability and several regions of minimal vulnerability.

If we use such examples for the idea of vulnerability, we get a sense of what is going on. In fact, this is how human beings learn new words representing "abstract" concepts such as "time". The idea of vulnerability employed when constructing such a table is based on the idea that a region has low vulnerability if the conditions in the region can be expected to continue in the same (safe) way.

1.2 Vulnerability of People

Claim: If we ask ourselves how vulnerable a *person* in a region is we can come up with a quantification of vulnerability. Such a question will depend on the region and refer to the question: Is there a particular dangerous or critical event threatening that person? The probability of such an event to occur differs between regions. This allows to establish a quantification and an ordering. Any probability is given by a number between 0 and 1; the

probability for the respective event to occur in the given region can be illustrated in a curve where each point has a value between 0 and 1. Coming up with a subjective idea for such a probability curve is easy. In a next step we can use data and Bayesian learning to improve the initial curve.

2. Solidarity of People and of Regions

2.1 Solidarity of People

If there is a serious risk, what options do people have to decrease it? This depends on the adaptive capacity. There are two important ways in which solidarity between people may improve the adaptive capacity of a person:

1) Face to face solidarity and face to face relations

Face to face relations are known to decrease the risk for heart attacks and increase business success; even scientific work is enhanced if carried out in a trusting environment. The downside of this is that if face to face relations are disrupted, the capacity to cope with pressure is lowered. Highly industrialised societies are disrupting face to face solidarity. Our work and family life have become entirely independent of each other. In general, our economy does not pay any attention to the sustenance of face to face relations. Some groups of people that migrate together have the ability to rebuild their networks in a foreign country and thus leave their solidarity-based adaptive capacity intact.

2) Insurance, i.e. institutional solidarity

Many things are only threatening because we are not insured.

We may depict the context of exposure, sensitivity and adaptive capacity as follows:

Critical events → Probabilities resulting in Suffering → Adaptive capacity

The adaptive capacity is not a number - nevertheless it is real. Critical events together with their probability give the exposure. The given sensitivity manifests in the form of suffering. The adaptive capacity in the last step is increased through both the presence of insurance and the presence of solidarity. The combination of all of these elements is the person's (or the system's) vulnerability. If we investigate the available solidarity and insurance we arrive at a good approximation of the adaptive capacity.

2.2 Solidarity of Regions

Question: Can we find examples of solidarity between large-scale regions within history?

Suggestions from the audience:

The impact of sub-Saharan droughts ameliorated with food supplies from Europe

The Soviet Union and Cuba

The Marshall plan after the II. World War

In the last example we find - for the first time in the (known) history of mankind - that the victor does not ask for retaliation but instead offers significant resources to the defeated party. In fact, (true) solidarity is something that is independent of response, independent of the outcome (compare the Prisoners' Dilemma).

Question: In the face of global vulnerability, is there *an honest and sound* scientific approach that does not take into account new forms of interregional solidarity?

In older times, risk was spread across social networks. Nowadays we have insurance. Insurance also spreads the burden across a network. Within larger networks, people can deal with exposure. We have developed economic institutions that have increased our well-being, now we are learning about their downside. We need to find out (probably within the next 20

to 30 years), how to address and decrease these downsides. It is also true that if we had never broken face to face networks we would never have come up with interregional solidarity. So, this process leads to us creating new networks.

Question from the audience: Do we face a decrease in solidarity on this planet?

Only to the extent that we can think of solidarity in terms of numbers.

Question from the audience: Does solidarity without wanting a beneficial outcome for oneself exist?

This is a matter of technical definition: “whose benefit”? Usually we write down utility functions that are independent of the other person involved. This is a technical mistake. People are brainwashed into thinking that they will be happier if they disentangle their happiness from others and the others’ happiness!

Question from the audience: How should one interpret individualism in the context of solidarity?

Again this is a question of the technical definition. The view of solidarity that implies the sacrifice of the individual for the collective comes from empires of the past and will not help us today. The way out is to create relations between people that have the form of an agreement instead of sacrifice. For these one needs to make commitments and stick to them in the long term.

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