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Pathways to Resilience II:
The Social Ecology of Resilience
June 7th–10th, 2010

 Resilience Research Centre
 DALHOUSIE UNIVERSITY School of Social Work
Halifax, NS Canada
Inspiring Minds

To present a paper, poster, or contribute to a facilitated discussion at the conference, please submit your abstract at www.resilienceresearch.org. Abstracts are being accepted until November 9th 2009.

Resilience and correlated concepts

A physicist view

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Some inspiration from Physics...

The study of a phenomenon starts in “real life” with observation and verbal descriptions

***When a “critical amount” of descriptions is available, is time for analysis, looking for:
criteria for grouping descriptions together
constitutive elements = concept candidates
taxonomies***

slowly, by trial and error...

A confuse conceptual frameworks hinders the exchange of knowledge (hence, its advancement).

Concepts must be clear and rigorous, and must be accepted and shared by the whole research community.



Resilience is...

Resilience is undoubtedly an important idea, but there is no general agreement on the *most convenient way* to look at it.

We wish to present some thoughts which may help to identify this most convenient way.

***Most convenient way:* the most simple, transparent, and logical way which allows to control the phenomenon towards the desired result, within a previously established approximation.**

It is unimportant what resilience actually is!

All that matters is to find the most convenient way to look at it – clear, rigorous, accepted and shared by the whole research community.



Looking at resilience I

Is resilience a trait, a process or both? ***“Wrong” question!***

It is more convenient to look at resilience as a trait, a process, or both? ***that is the core question!***

The core question may have several ad hoc answers at the beginning (***limited domain models***), which tend to be unified as our understanding of the phenomenon progresses.

Unification (or *synthesis*) is a major theoretical achievement, which provides new applied skills, improving efficacy of already usual interventions and suggesting new possibilities of action.

It is theory's *pay-back* to application.



Looking at resilience II

- ***Phenomenon:*** real life “as it is”, with its full complexity.
- ***Process:*** some abstraction, part of real life relevant to our interest.
- ***Mechanism:*** logical description of the way the process functions, already structured on concepts and relations.
- ***Variables:*** the subset of concepts that appear in the context of the phenomenon with different (qualitative or quantitative)... “flavors”.

only the quantitative are measurable...

In which of the categories above does resilience fit best?

I see resilience as a phenomenon/process

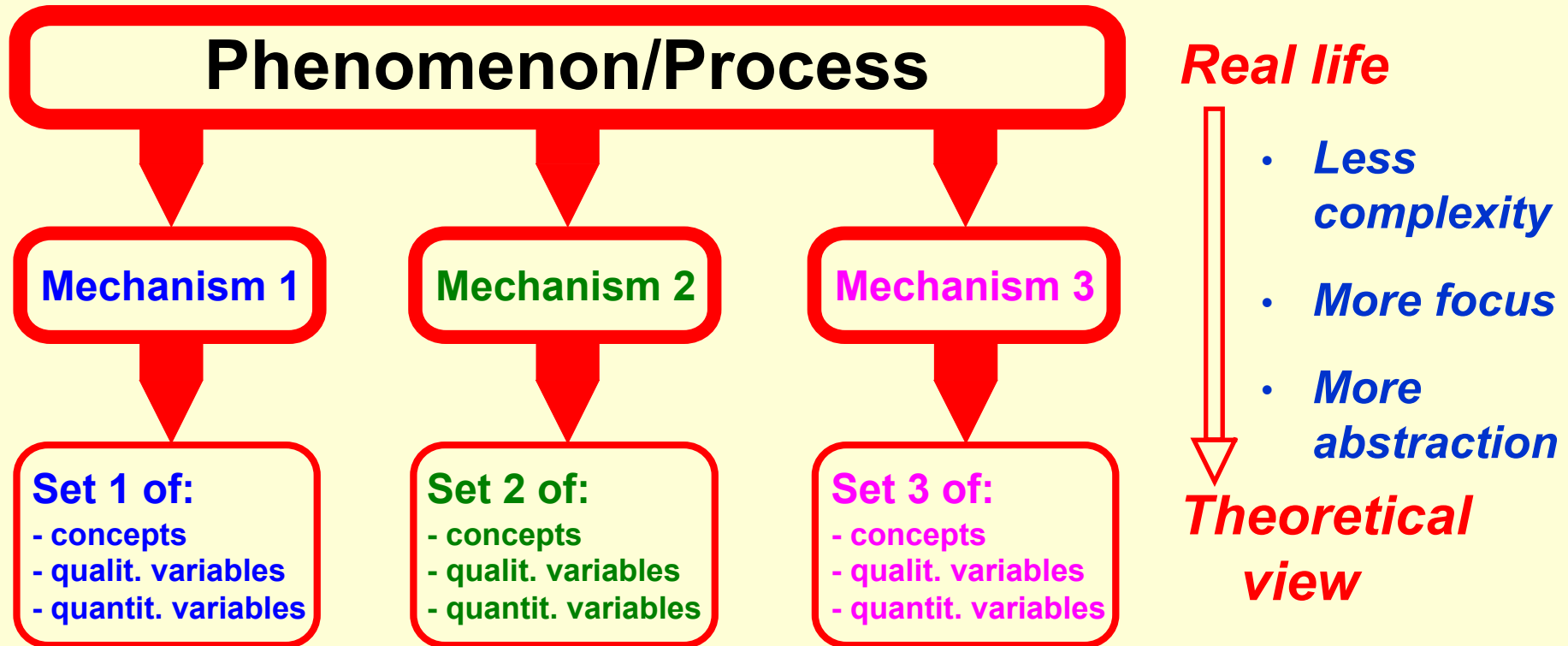


Resilience as a phenomenon/process

When one says *this system has been resilient*, this *does not* mean that the system has something inside called *resilience*, but that it has a *specific* set of competencies (skills) to be able to go on functioning normally after passing through severe (“bad”) stress.

but this implies a difficulty to measure resilience: phenomena are not measurable, only variables do!!

Looking at resilience III



Some “more important” concepts and variables:

- appear in more than just one set
- keep themselves meaningful up to the process level

The latter can be used to “measure” the phenomenon, but will actually contain only partial information on it.



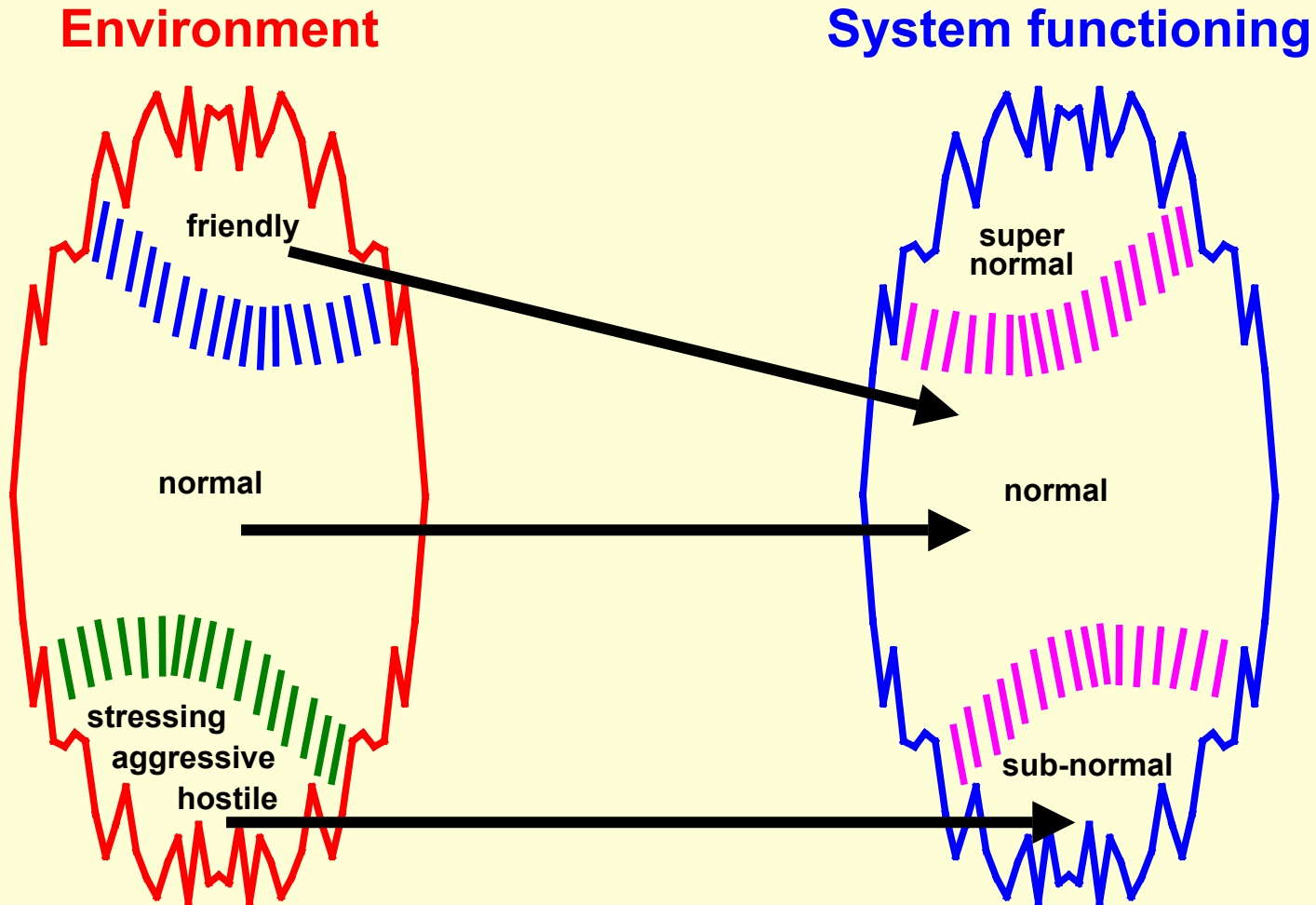
More inspiration from Physics I...

1. The concept of **system**: the most convenient entity (in the Universe) one is interested in (for a certain study).
 - **System** can be a person, a person with certain attributes (age, social condition), a group of persons (?family?), an object, anything
 - **But has to be specified in a way such that it absolutely clear if some part of the universe is or is not part of the system**
 - **Everything outside the system is part of the environment**
 - **A sample is a set equally specified systems**

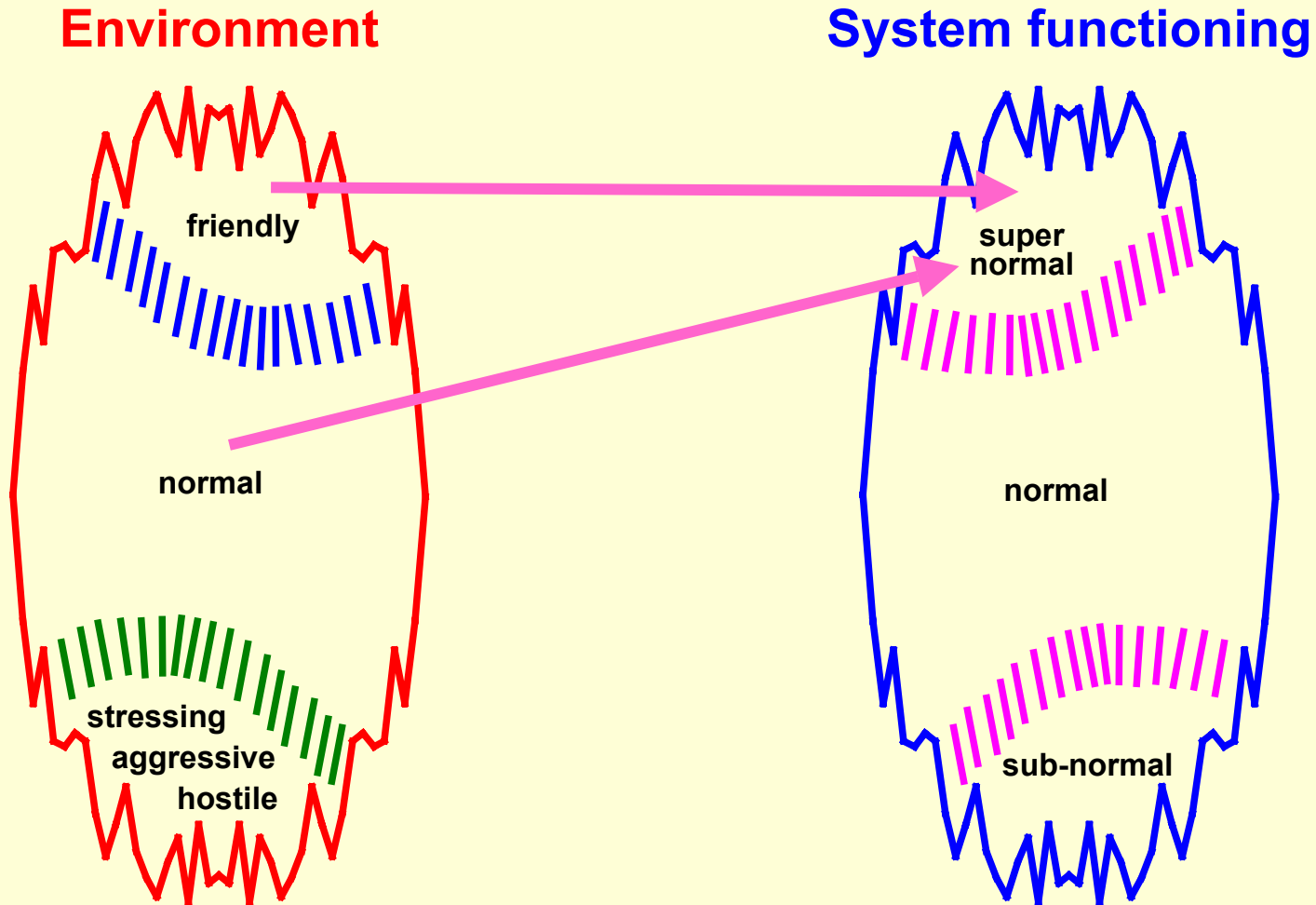
More inspiration from Physics II...

- 2. The physical concept of **resilience** involves the idea of functioning as desired or as specified; the system still attends its purposes, although it has been changed by use or stress; a device that still works, even if considerably... “attacked”...*
- **Functioning as desired or specified** can be seen as **functioning in a socially and culturally accepted way (or accordingly to socially accepted rules).***
 - **This is an external general criterion – good candidate to get a **critical dimension** of the concept!***

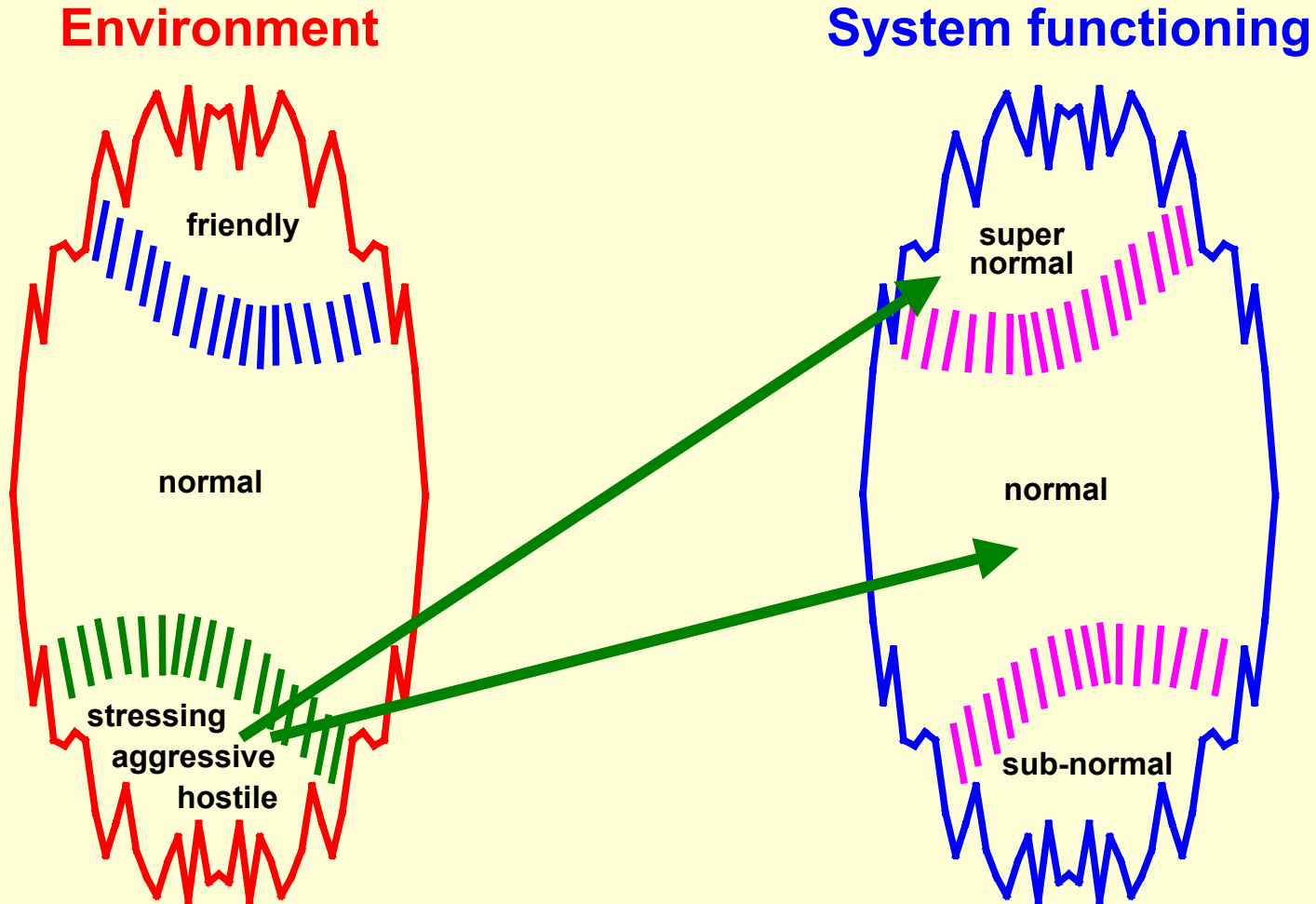
Dominant pathways for systems



Exceptional pathways for systems



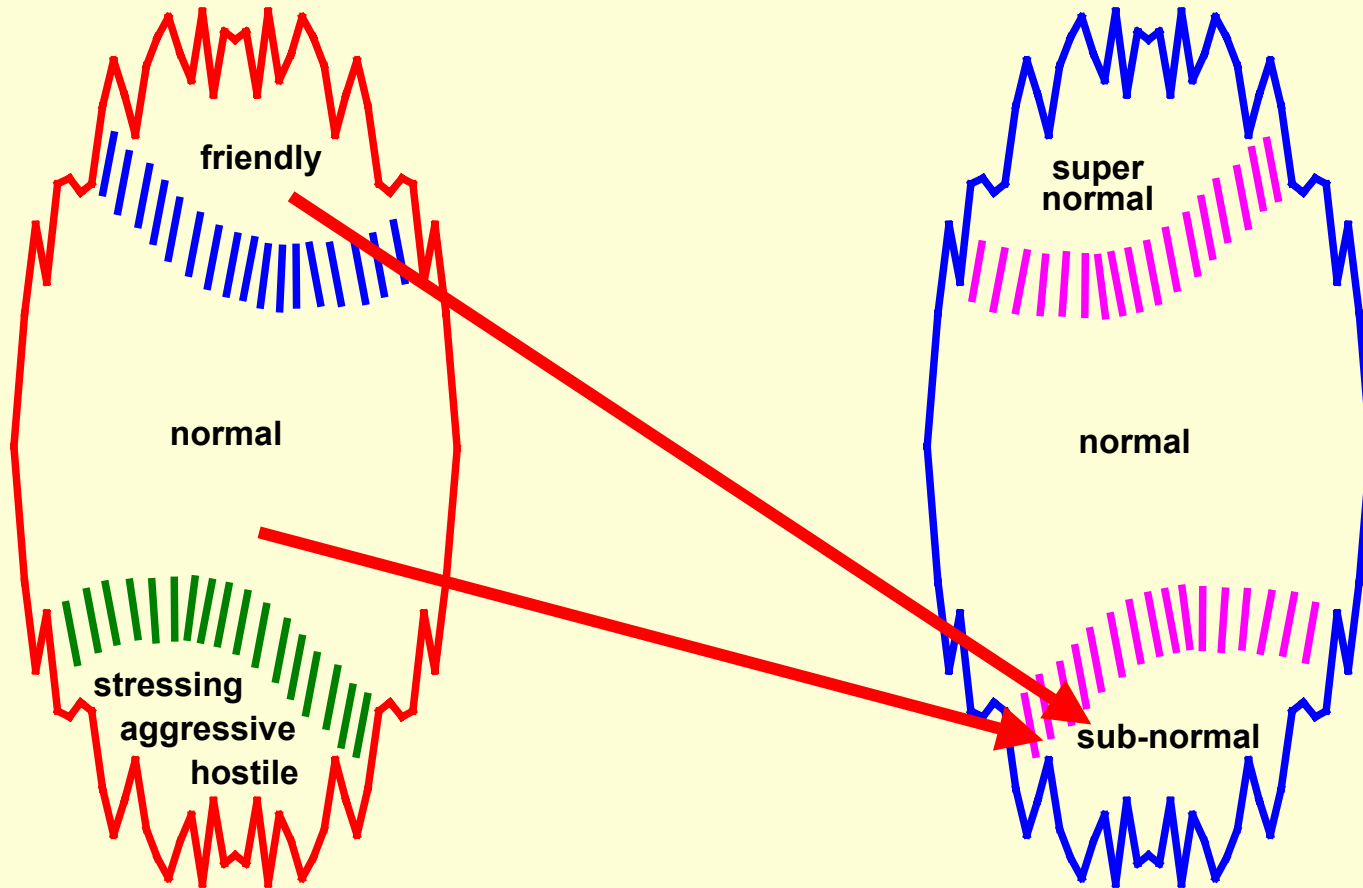
Resilient pathways for systems



?“Anti-resilient”? pathways for systems

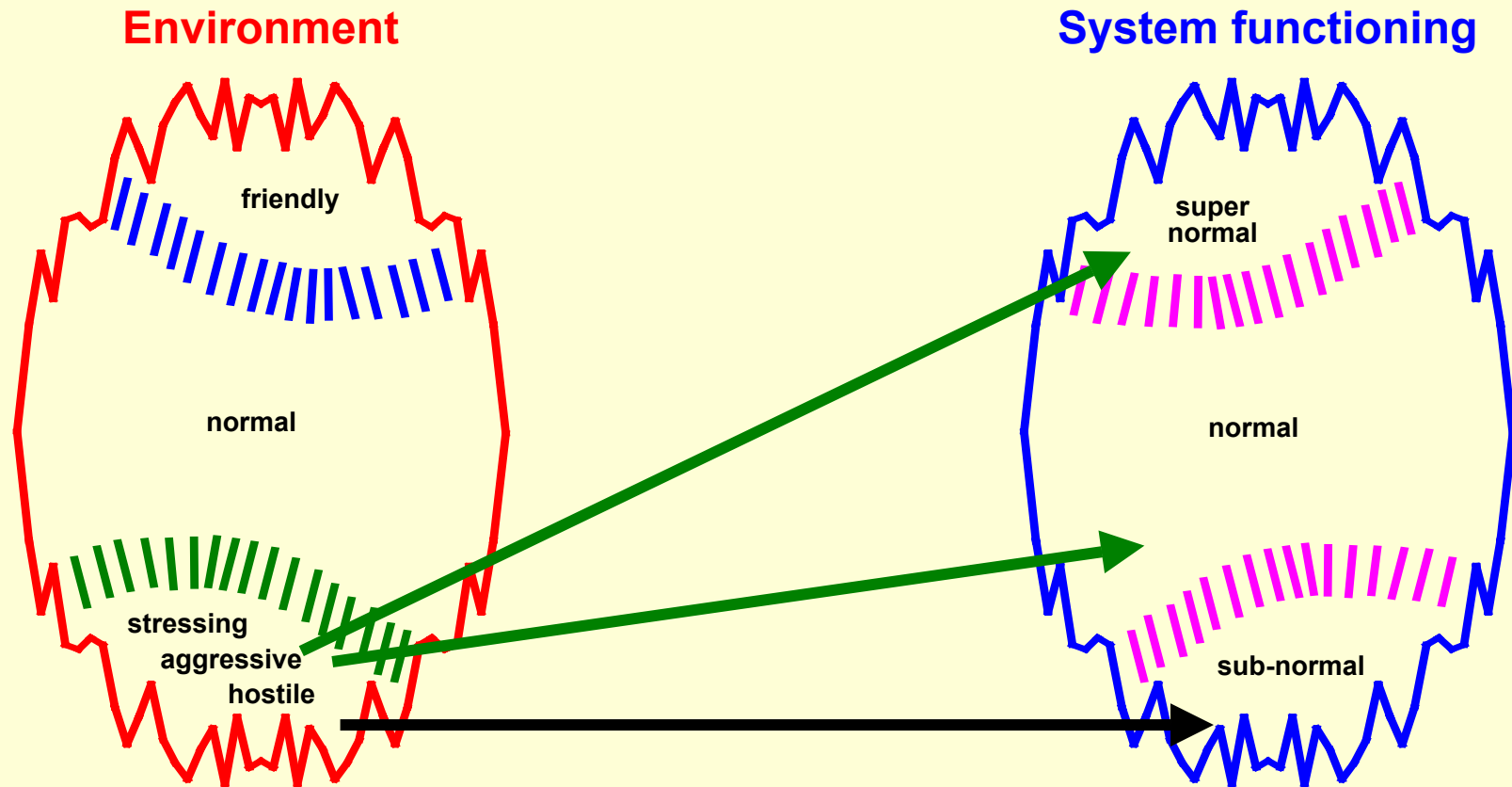
Environment

System functioning



To understand this evolution help understanding resilience! (?)

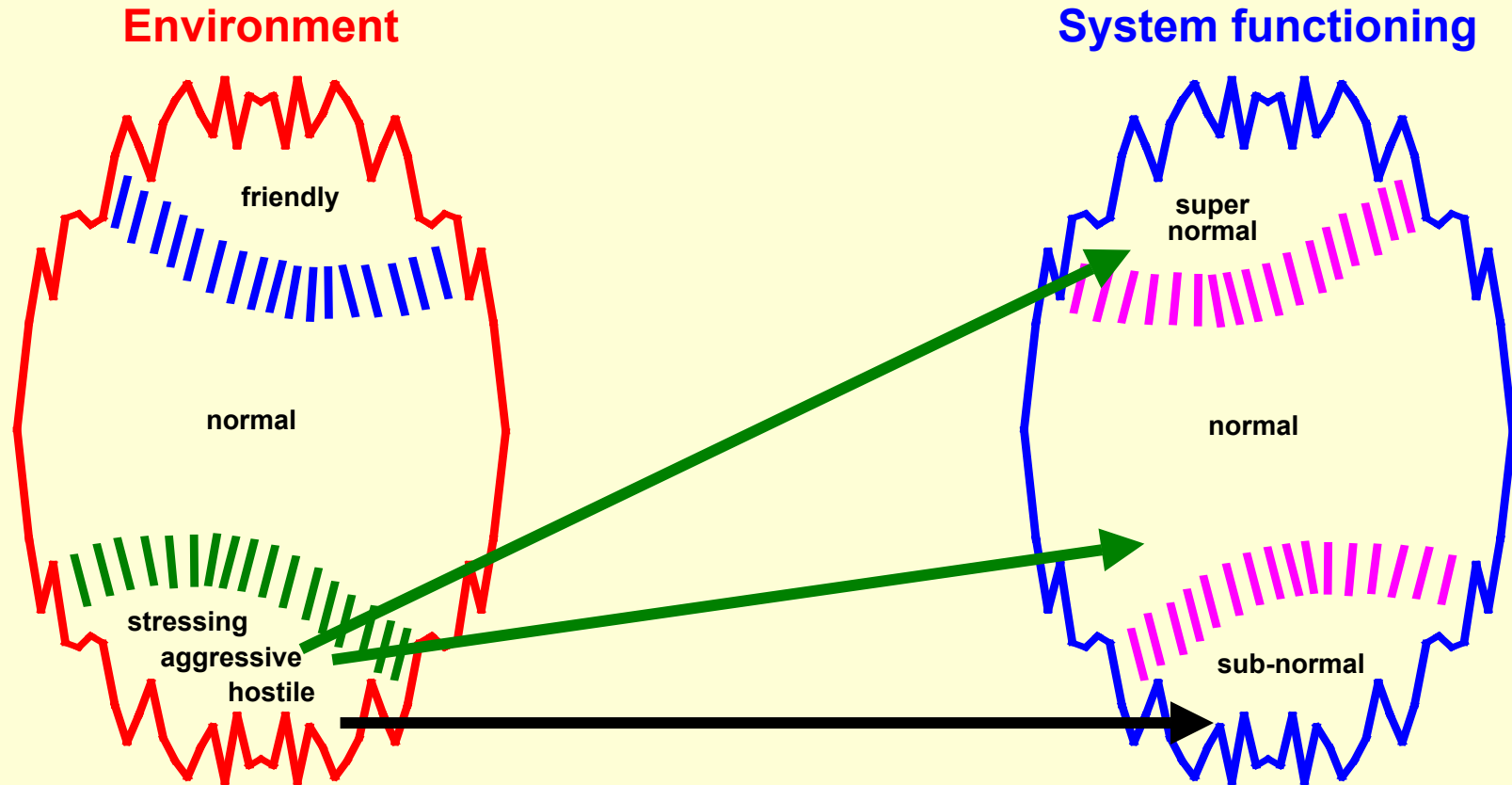
Focusing on resilience



This is typically a stochastic process, where the causal relation is mediated by a probability distribution.

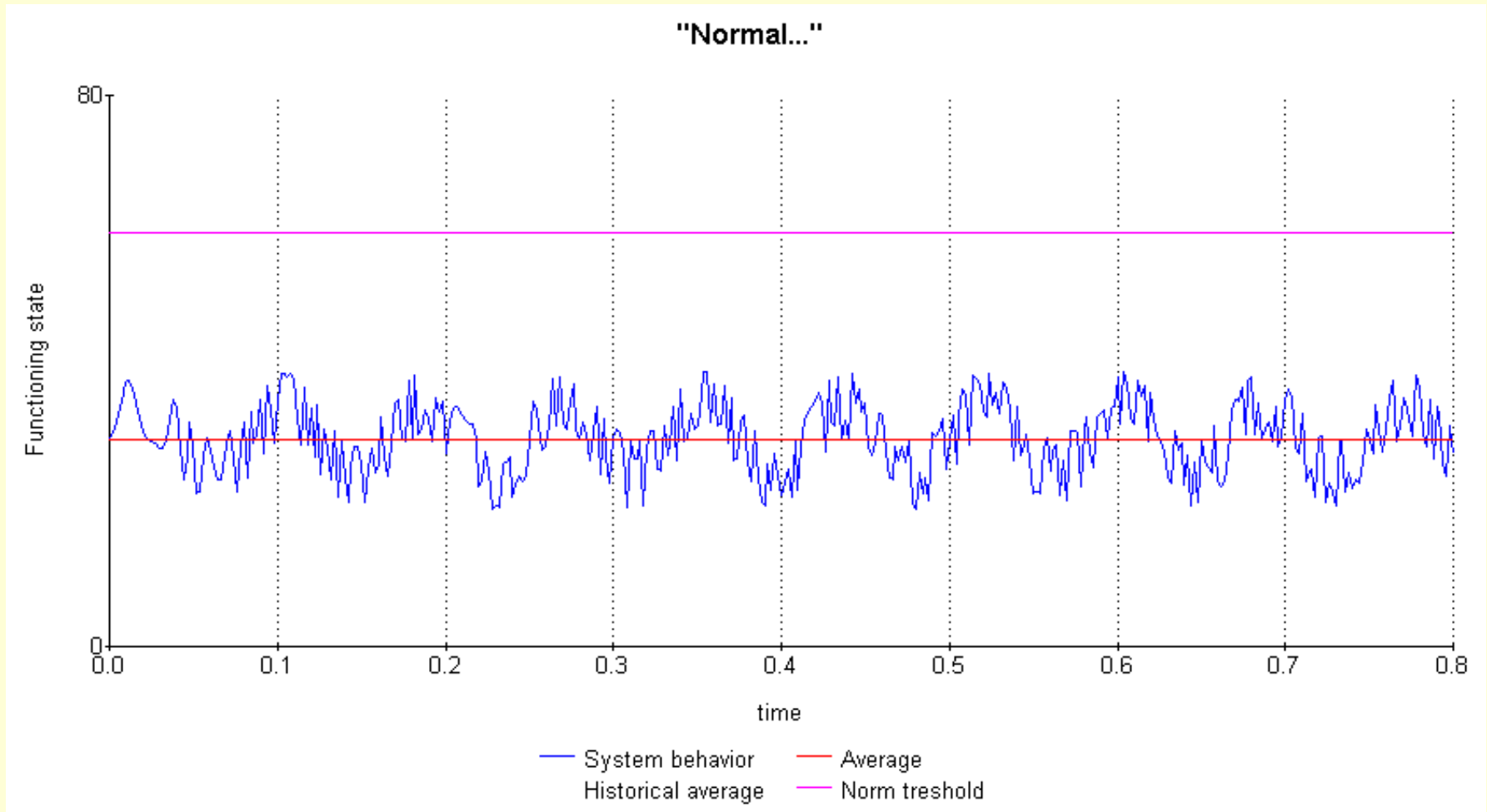
Goal of resilience research and intervention is to lower the dominant probability, favoring the other two.

Focusing on resilience



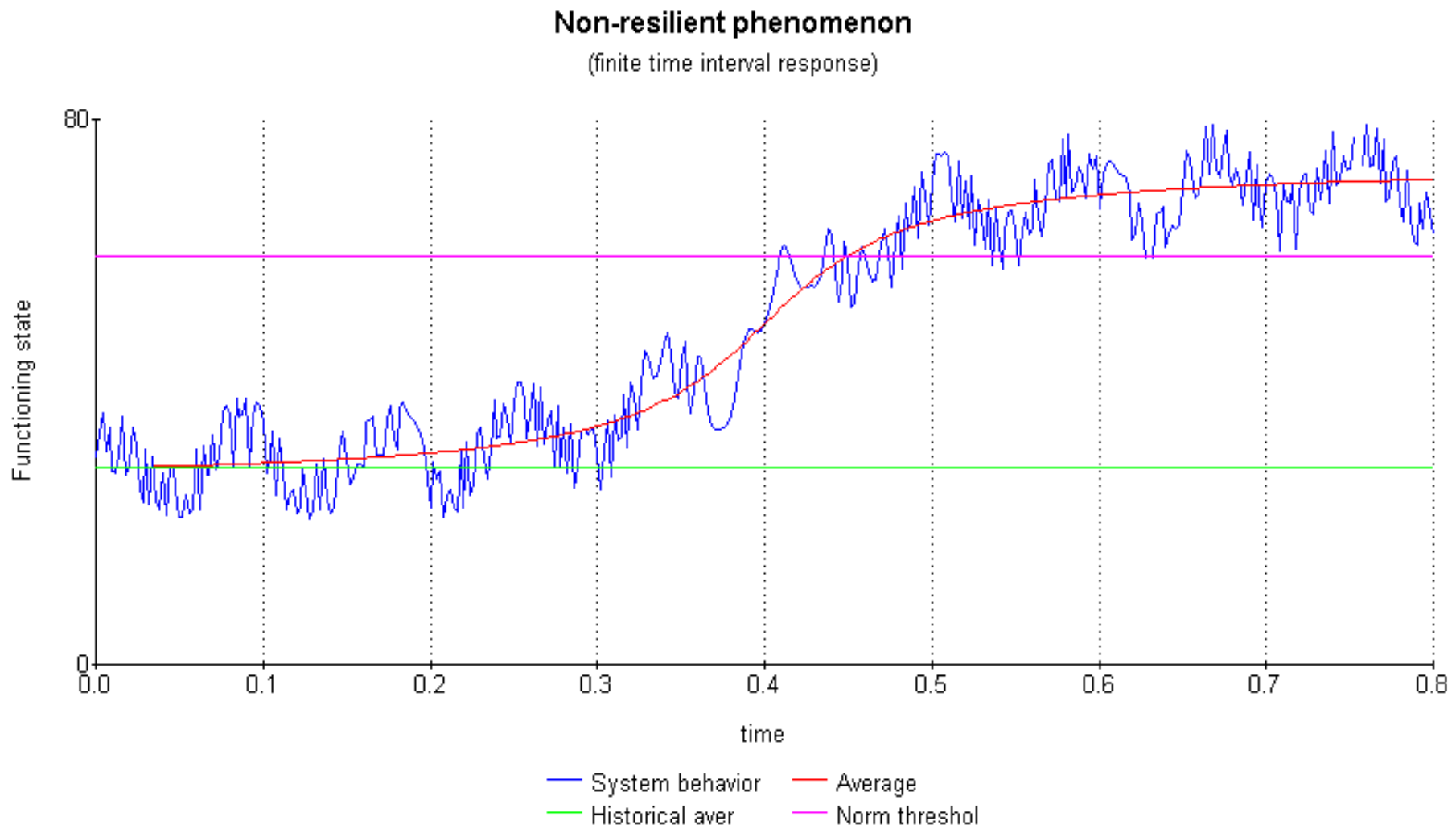
The fact that the black arrow process is dominant (probability larger than 50%) may be a second critical dimension of the concept of resilience, discriminating it against coping, adaptation, and others.

System behavior in the resilience phenomenon and types of intervenient variables I: system under normal circumstances (“normal” stress)



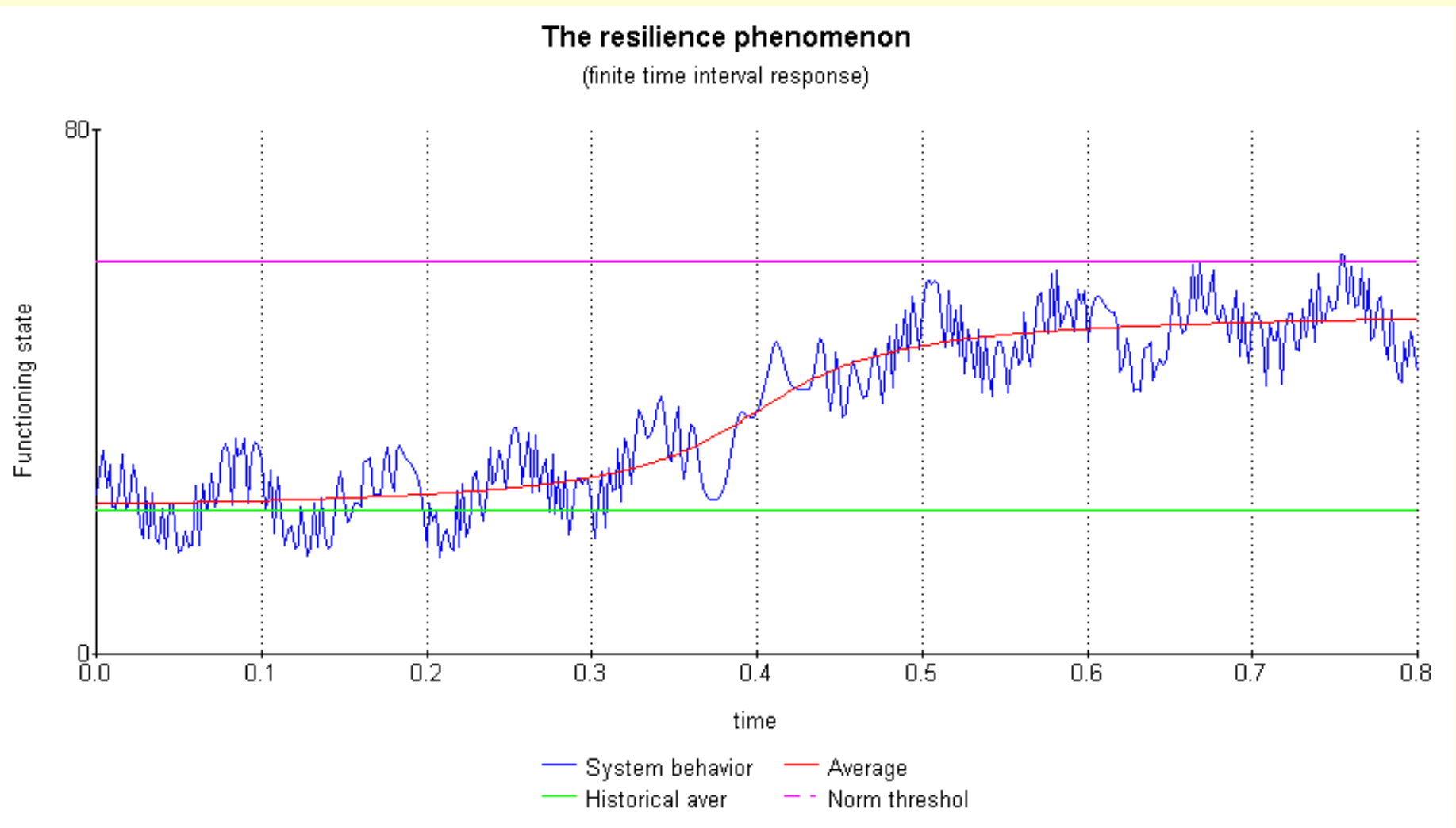
System behavior in resilience & intervenient variables II:

Non resilient behavior – finite time interval response

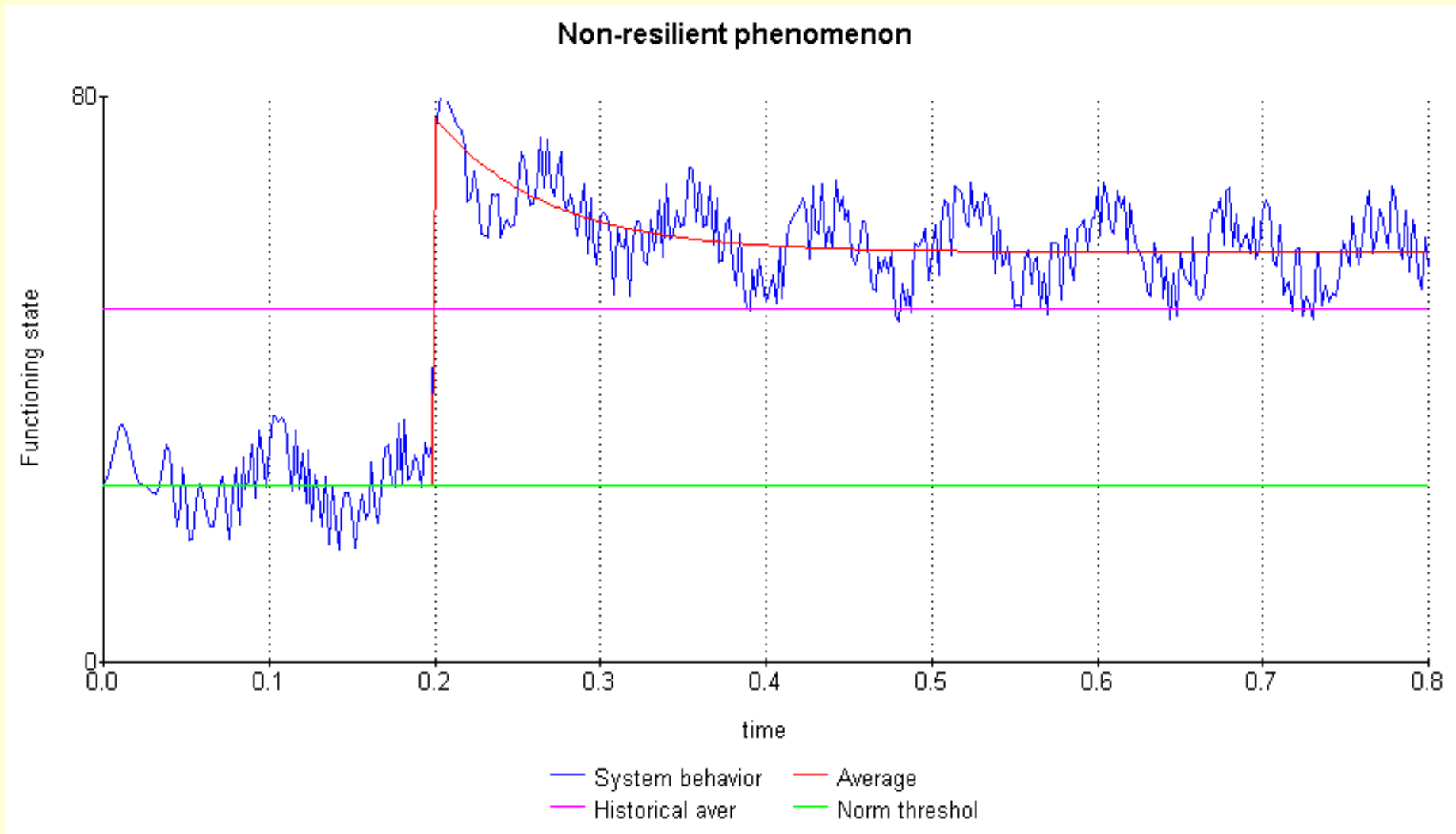


System behavior in resilience & intervenient variables III:

Resilient behavior – finite time interval response

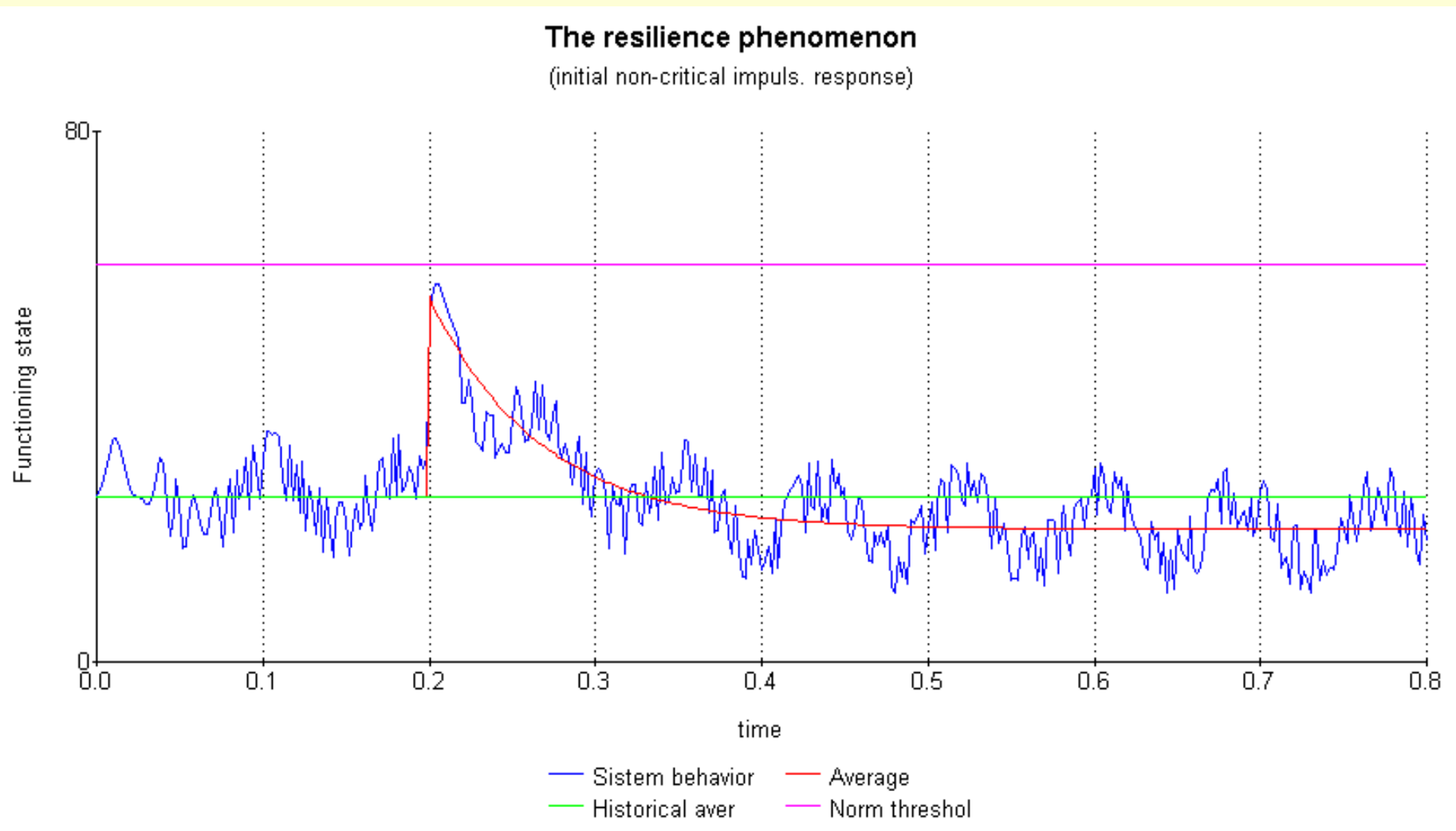


System behavior in resilience & intervenient variables IV: Non resilient behavior – critical impulsive response



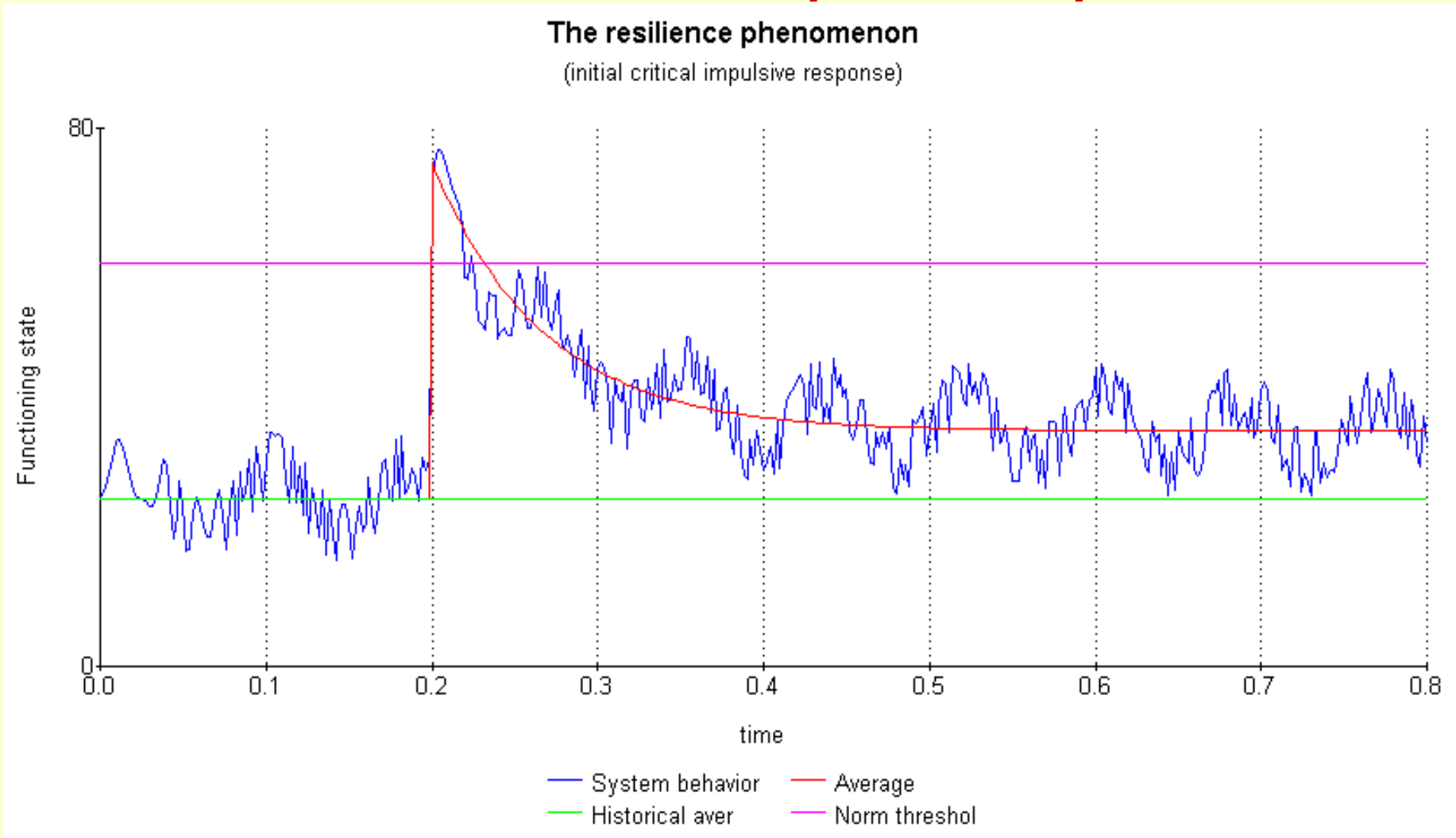
System behavior in resilience & intervenient variables VI:

Resilient behavior – non-critical impulsive response

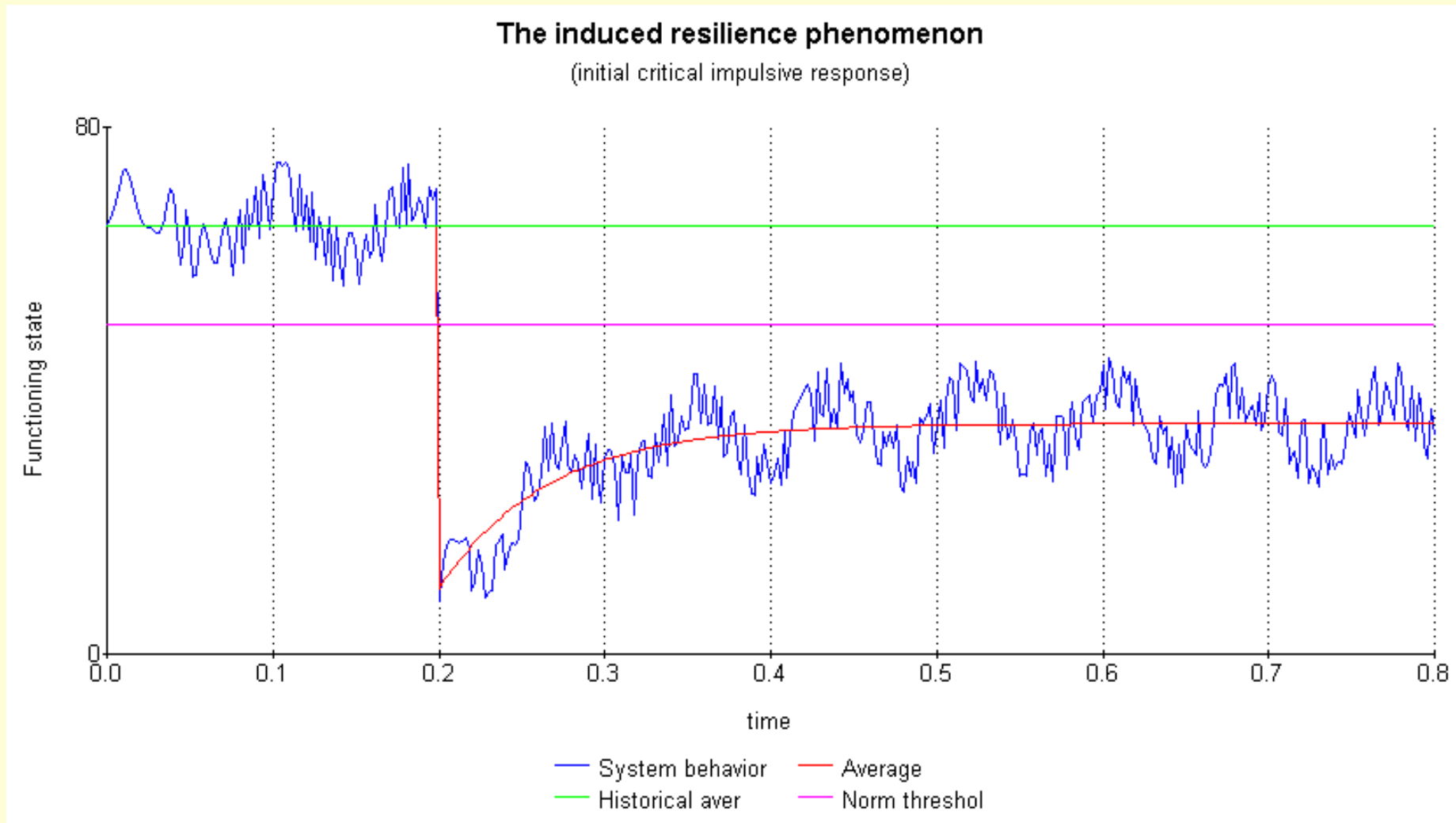


System behavior in resilience & intervenient variables V:

Resilient behavior – critical impulsive response



System behavior in resilience & intervenient variables VII: *Induced resilient behavior - impulsive response*



System behavior in resilience & intervenient variables VIII

Looking for variables and classifying them

To identify the “family” to which a certain variable belongs allows to understand its role in the mechanism at a glance, quickly taking action to enhance (for the *good* ones) or reduce (for the *bad*) its effects.

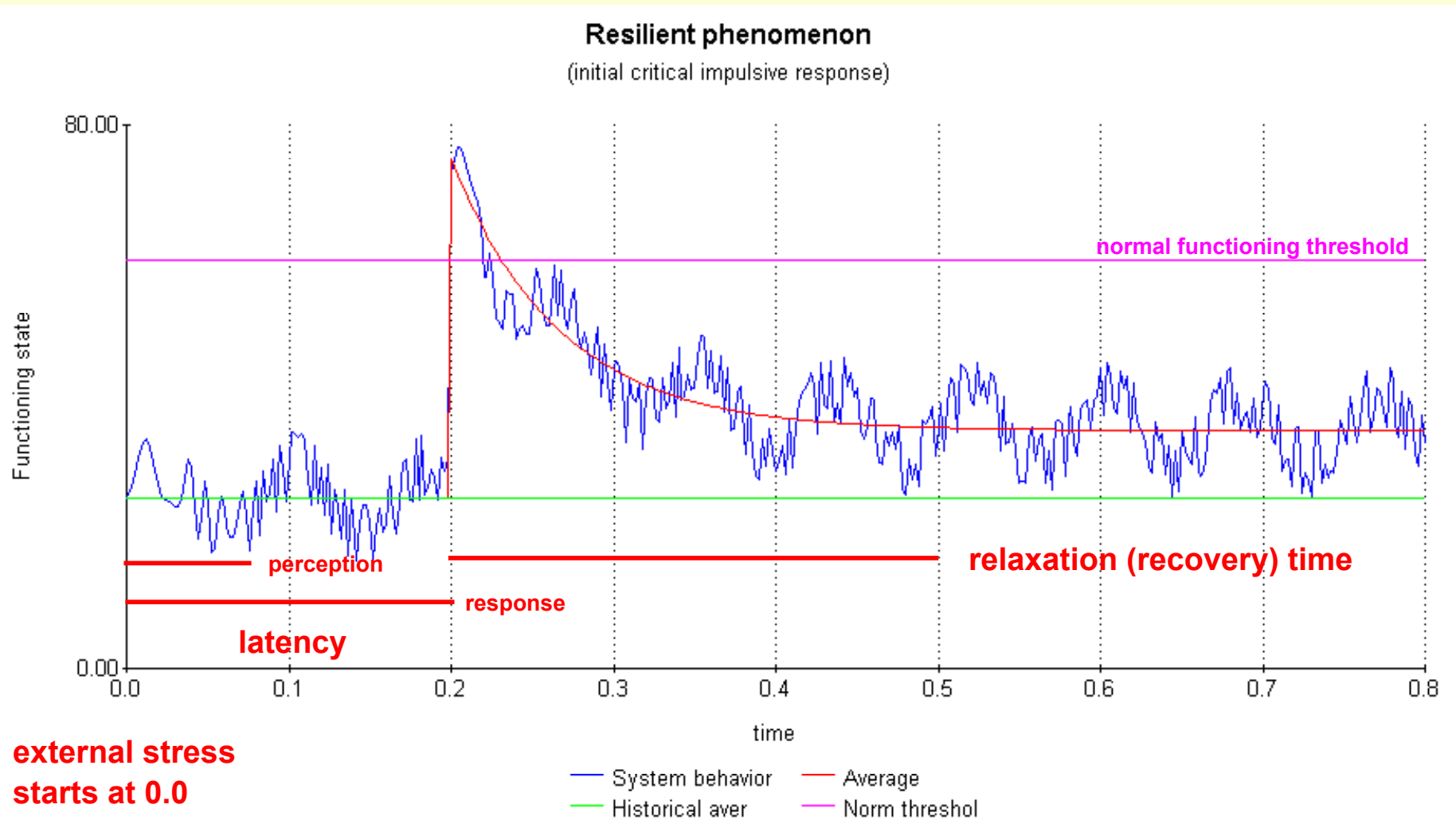
- ***Process variables:*** make the path towards the desired response more easy or more difficult.
- ***System variables:*** improve or reduce (quanti- or qualitatively) the competencies of the system to deal with the stressing environment/episode.

Examples (from tennis):

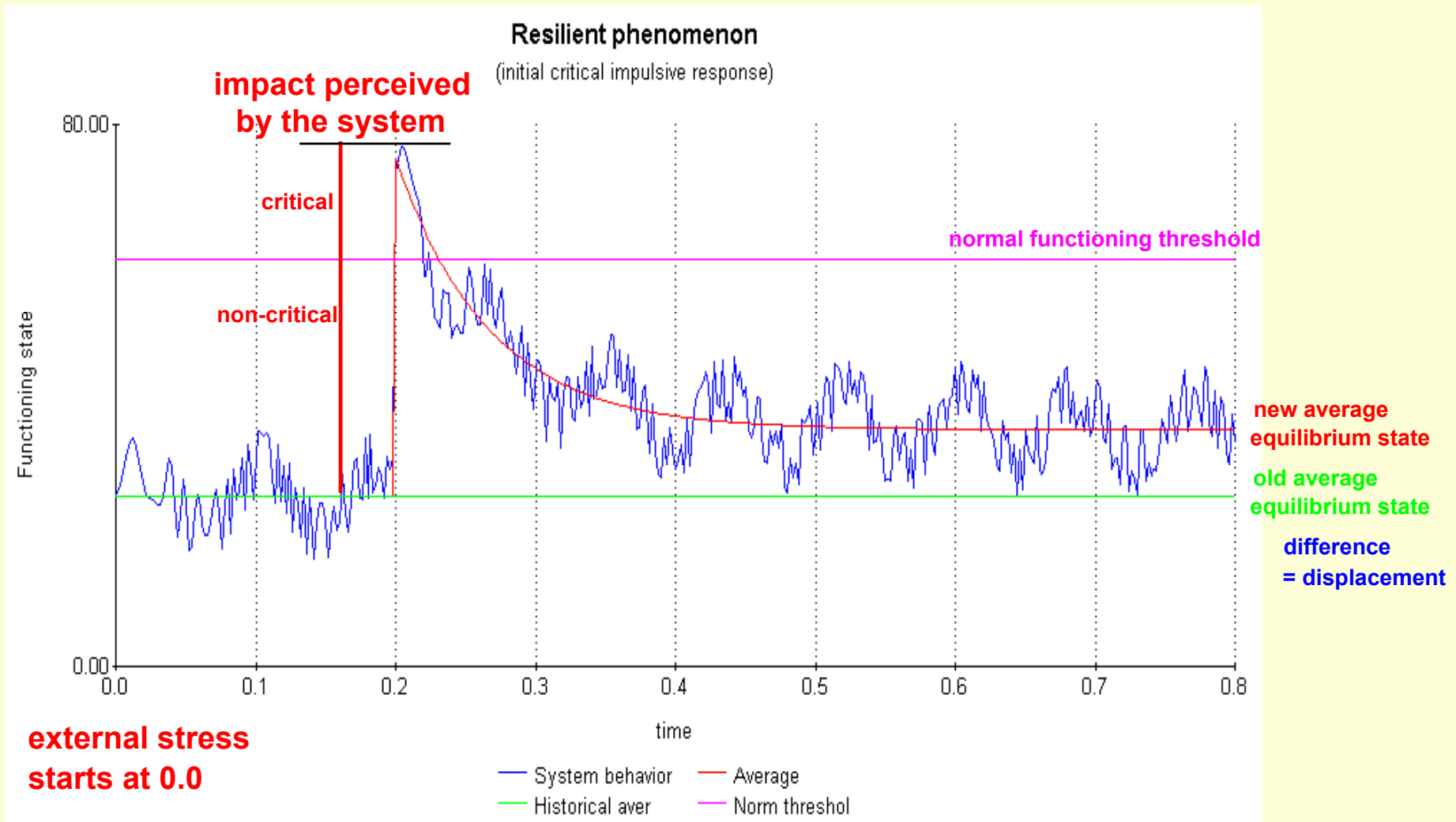
- ***Process variables:*** court surface, balls and rackets brands, referee and lines(women) ... (all qualitative..)
- ***System variables:*** stroke speed, percentage of double-faults, unforced errors ... (all quantitative...)

only the quantitative are measurable...

System behavior in resilience & intervenient variables IX: System variables I (measures done in the system)



System behavior in resilience & intervenient variables X: System variables II (measures done in the system)



System behavior in resilience & intervenient variables XI

Impact perceived by the system

(a model for assessment of system-environment interaction)

At least four effects to take into account (*inspired in beam effects*):

- ***Specific power***: “force” of impact. After all, stress is generated by information transferred to the system; this variable can be seen as amount of information divided by time of transference.
- ***Intensity***: total amount of transferred information, regardless of transference time.
- ***Absorbed “doses”***: information effectively absorbed by the system
- ***Damage/healing***: effect of the absorbed information on the behavior of the system.

1. The first two describe the environment;
the other two describe the system.

2. It easy to understand why systems present such a diversity of responses to an external stress.

System behavior in resilience & intervenient variables XI

Always look for symmetry!!!

It is fair to expect that each external influence that harms the system (risk factor) has a counterparts which strengthens it (protection factor).

- **Causal factor:** information able to modify the (long term average equilibrium) functioning of the system.
- **Intervenient factor:** is unable to modify the functioning of the system, but reduces or enhances the action of the causal factor (catalysis).
- **Activation factor:** an information too small to cause any direct change on the system, but may *trigger* (activate) a latent causal factor.
- **Shielding factor:** mitigates (reduces) the effect of any other factor (the “bad” ones, but also the “good” ones...)
- The greater the **sensitivity**, the larger will be the system response to a certain factor (vulnerability/?immunity?).



Summary

- **Resilience** is a phenomenon, which corresponds to a specific evolution of a system in time.
- **Resilience** is not something that exists inside the system; however, the resilient system presents skills which allow it to go on functioning normally under severe adverse environmental conditions; (most equal systems would not function normally any more under the same environmental conditions).
- The study of systems that stop functioning in friendly or normal environments may bring important contributions to the comprehension of **resilience**.



Summary

- The study of the phenomena of non-normally functioning systems which come back to normally functioning seem to also belong to the domain of resilience (*spontaneous resilience*, and accidentally or deliberately *induced resilience*) .
- Categories of variables: system and process; active or responsive (re-active); risk or protection; shielding; sensitivity.
- Assessment is complicated!!
but seems to be possible!!

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