

Unified Theory of Information als Kernstück einer *Science of Information*

Wolfgang Hofkirchner

The Institute for a Global Sustainable Information Society (GSIS);

International Society for the Study of Information (IS4SI);

Research Unit Human Computer Interaction, Institute of Visual Computing and Human-Centered Technology,
Faculty of Informatics, TU Wien

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1 Annäherungen an Information: Capurros Trilemma (aufgelöst)

	information terms	discussion
synonymity (reduction)	one and the same meaning	false unification attempt (identity)
analogy (projection)	similar meanings	failed unification attempt (identity): what is the standard of comparison?
equivocity (disjunction)	disparate meanings	surrender to diversification (in-/ difference): Babel

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equivocity (disjunction)	disparate meanings	surrender to diversification (in-/ difference): Babel
specification hierarchy (integration)	historically-logically connected meanings: reproducing evolutionary steps (emergence)	unity-through-diversity attempt (identity and difference): never-ending process of defining and refining

1 Annäherungen an Information: Capurros Trilemma (aufgelöst)

	handling...	understanding...	studying information
synonymity (reduction)	objectivism	materialism	externalism
	object of action	material object	third-person study object
analogy (projection), equivocity (disjunction)	subjectivism	idealism	internalism
	subjective action	immaterial action (monistic, dualist)	interpretative action (first-person study)
specification hierarchy (integration)	subject-object dialectics	emergentist materialism	perspective shifting
	subjective/objective	agency/relations	outside/inside

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2 Eine vereinheitlichte Theorie der Information (UTI) als Kernstück einer "Wissenschaft von der Information"

The historical-logical account of information:

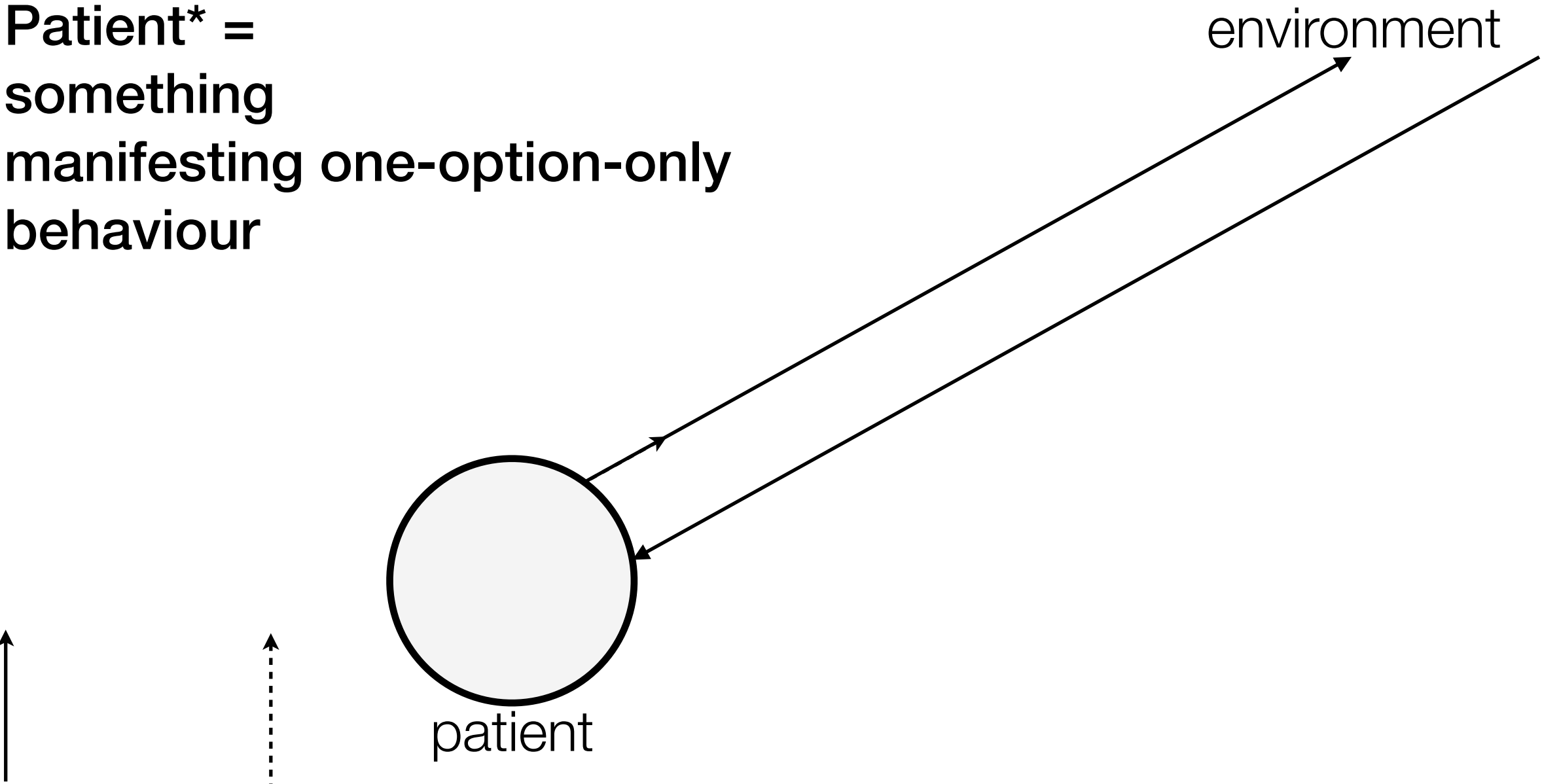
- the meaning of the concept of information has to comprehend both what different manifestations have in **common** and what is **unique** to each of them;
- historical manifestations of information **descend** from earlier manifestations but do **not derive** from them logically;
- each understanding of a **particular** manifestation enriches and extends the **universal** concept.

2.1 Emergente Information

Information co-extends with self-organisation.

2.1 Emergente Information

**Patient* =
something
manifesting one-option-only
behaviour**



input/output

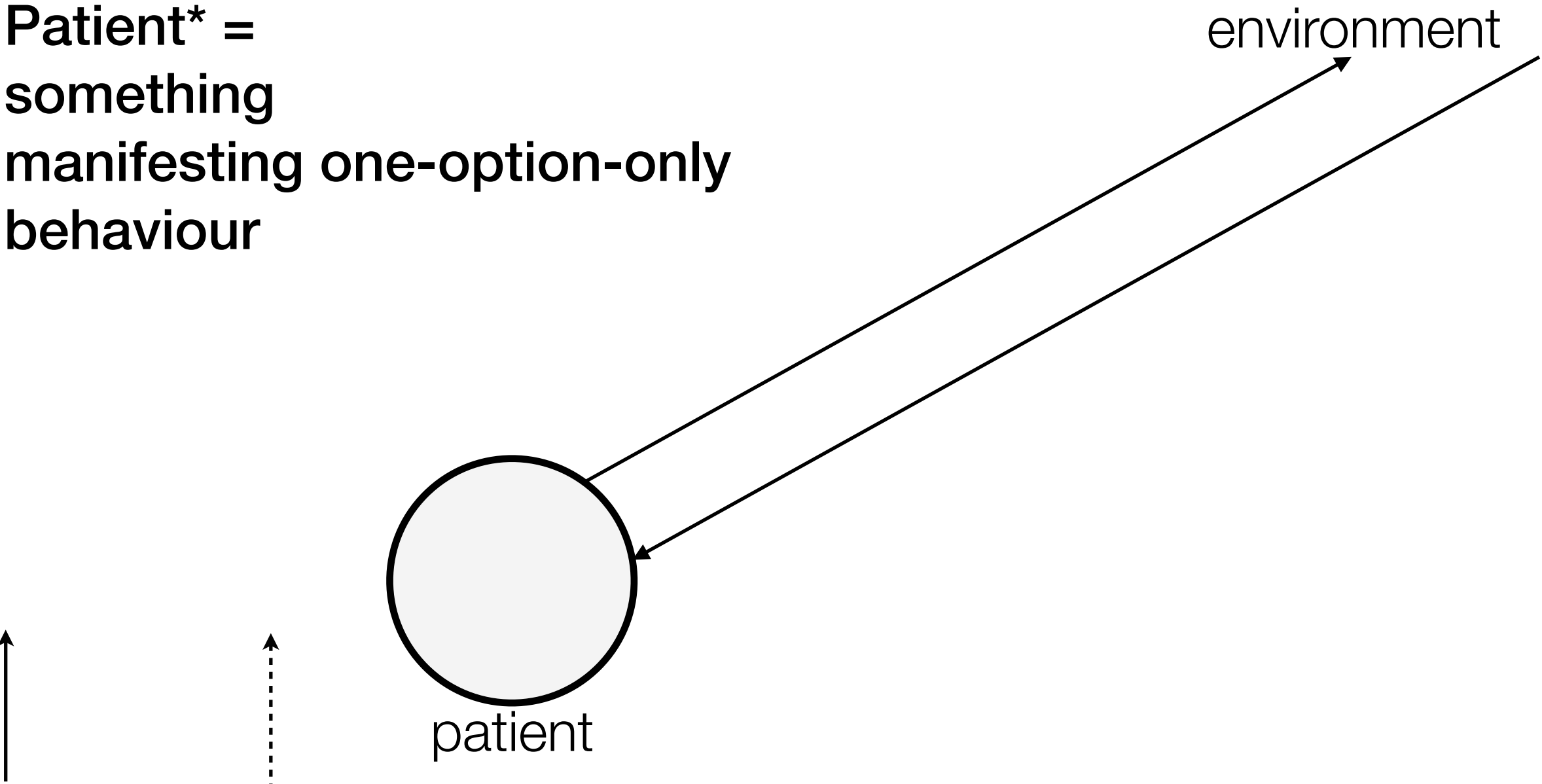
option



* Rafael Capurro

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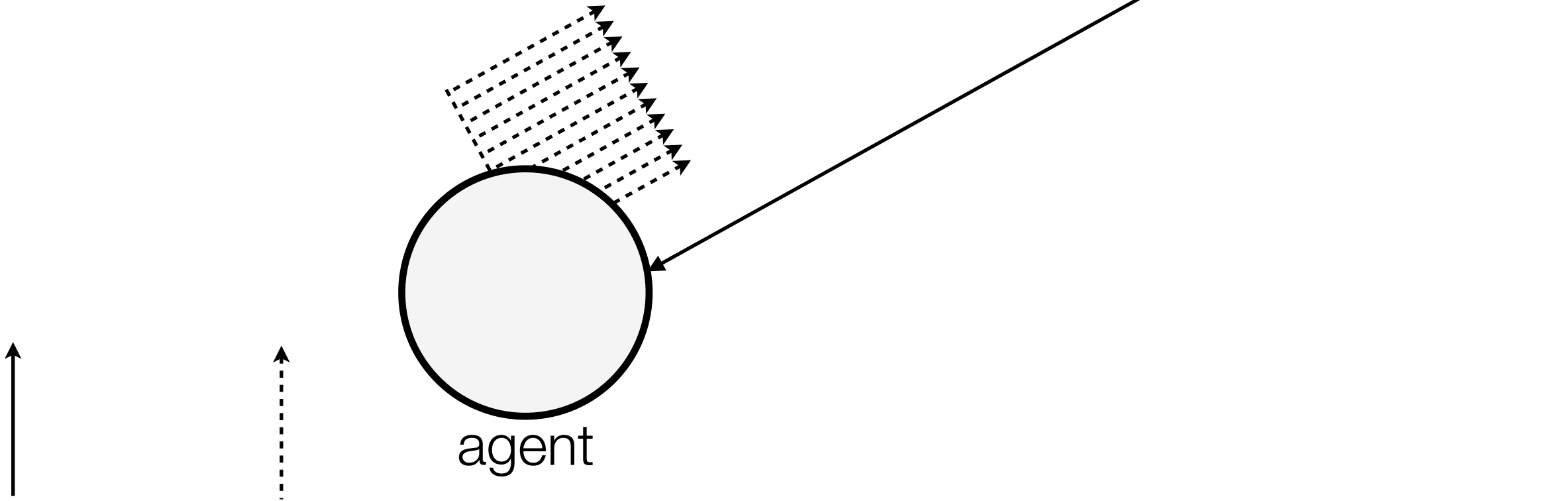


* Rafael Capurro

2.1 Emergente Information

**Agent* =
something
having a choice between
several options**

environment



input/output

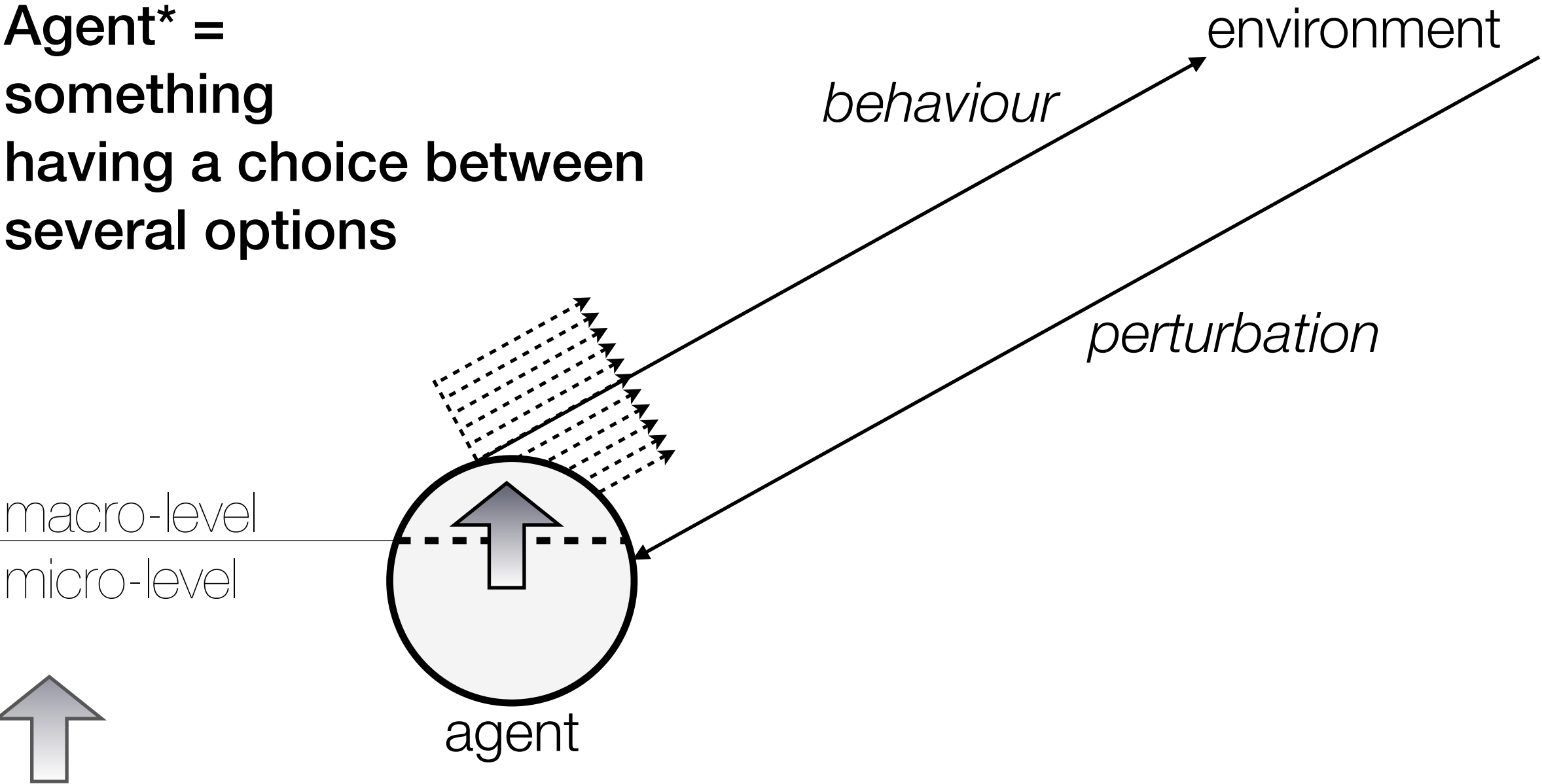
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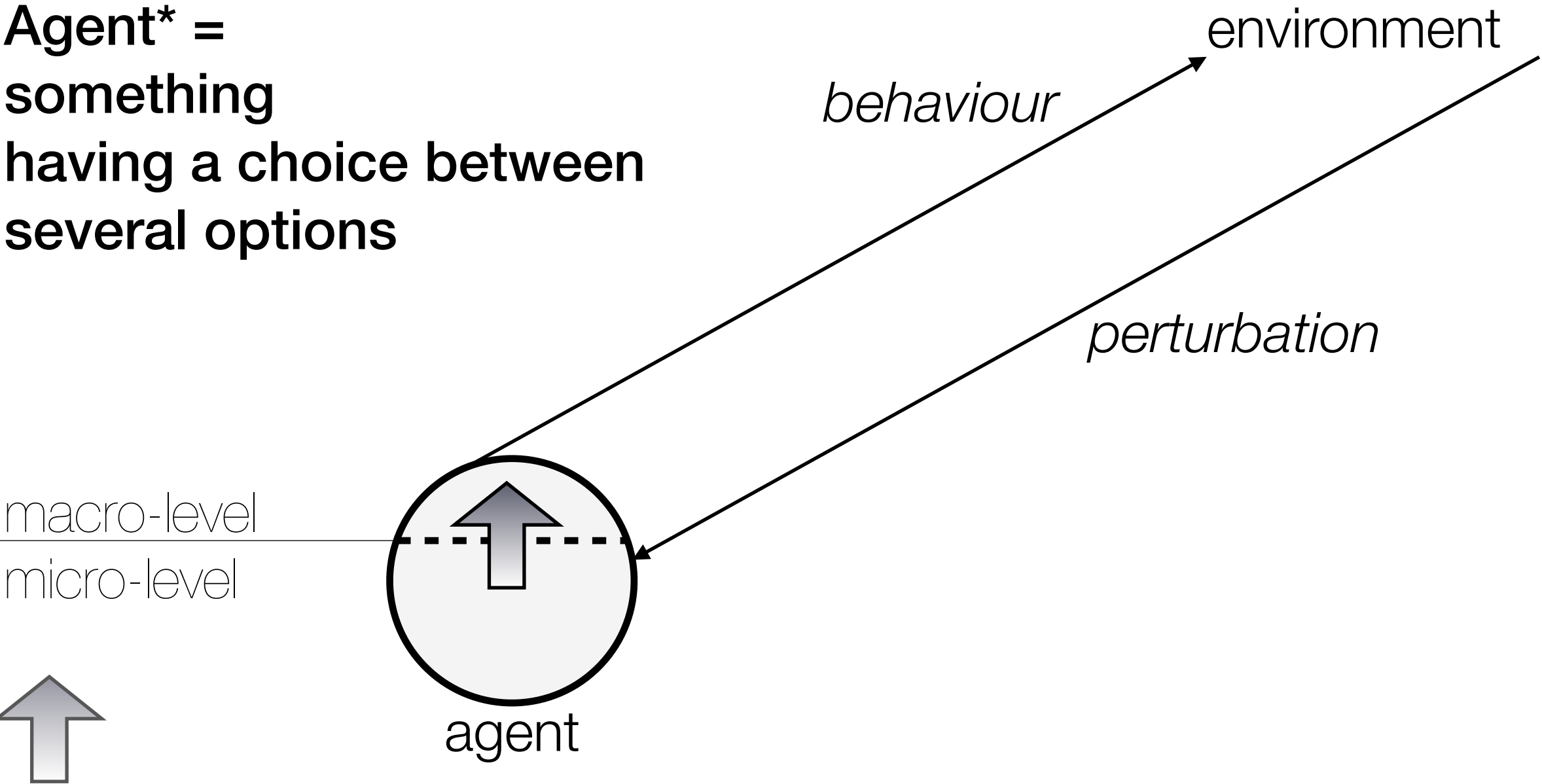
self-organisation (emergence of order)



* Rafael Capurro

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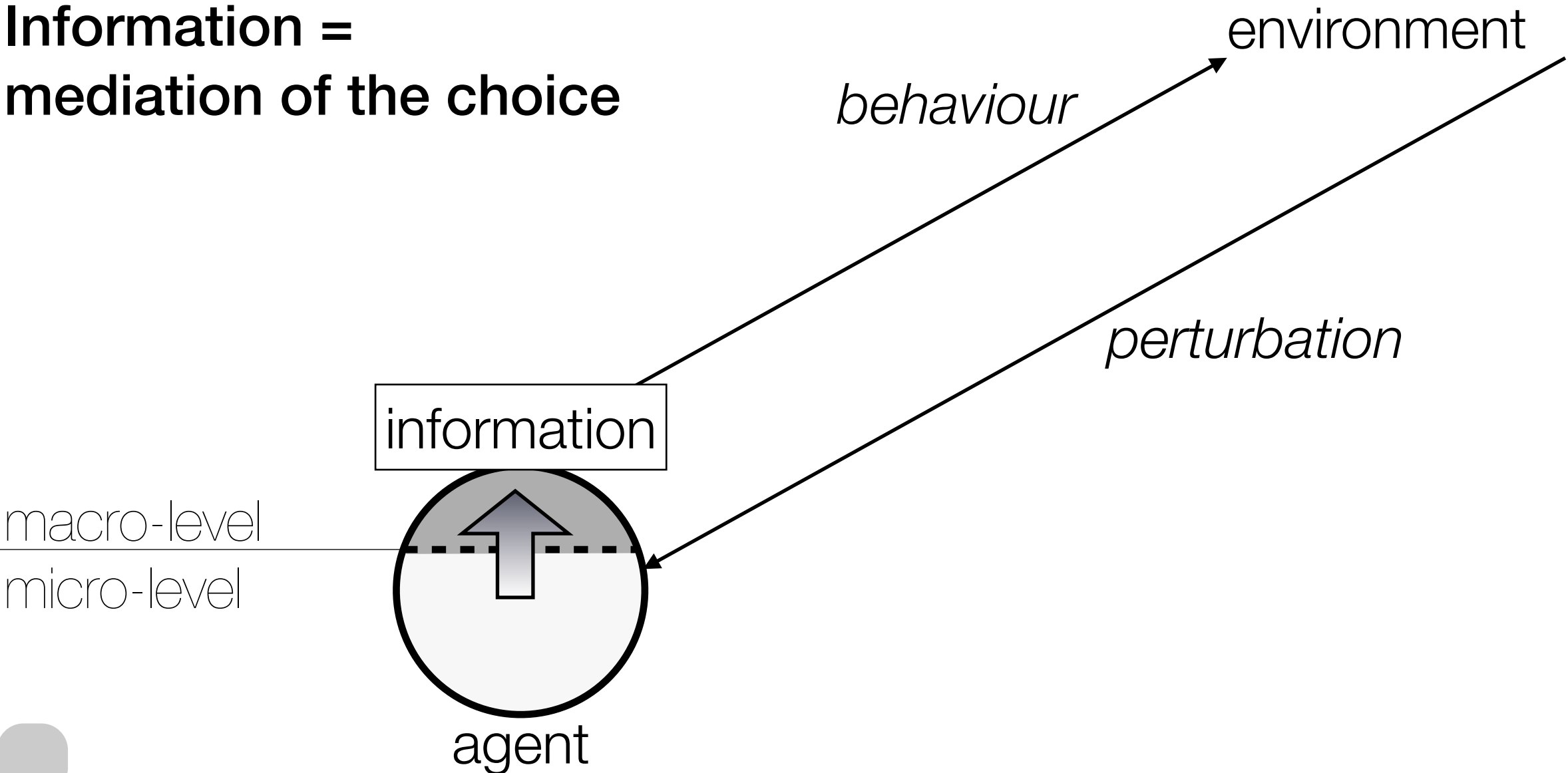
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2.1 Emergente Information

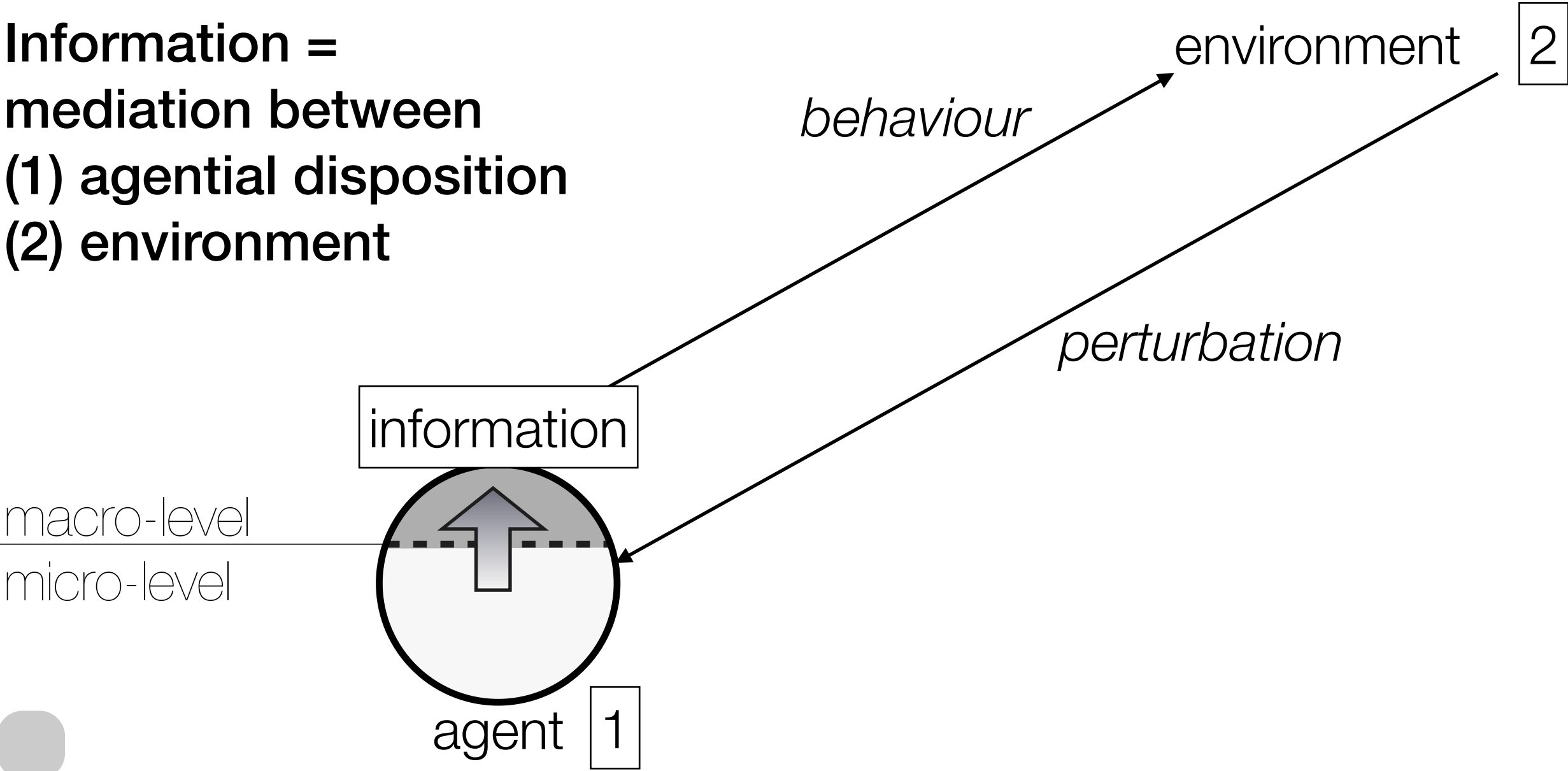
**Information =
mediation of the choice**



self-organised order = generated/utilised information (mediator)

2.1 Emergente Information

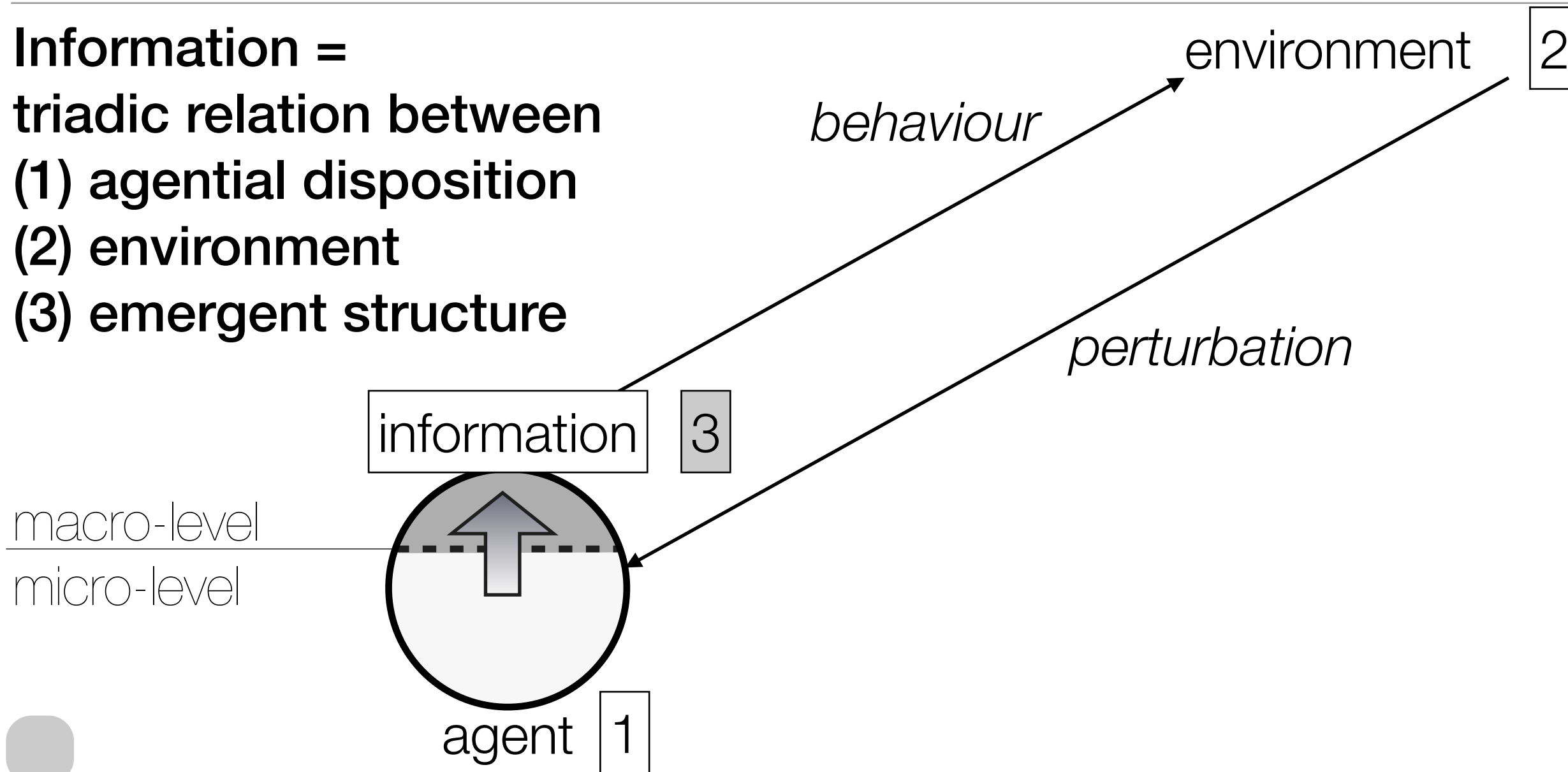
**Information =
mediation between
(1) agential disposition
(2) environment**



self-organised order = generated/utilised information (mediator)

2.1 Emergente Information

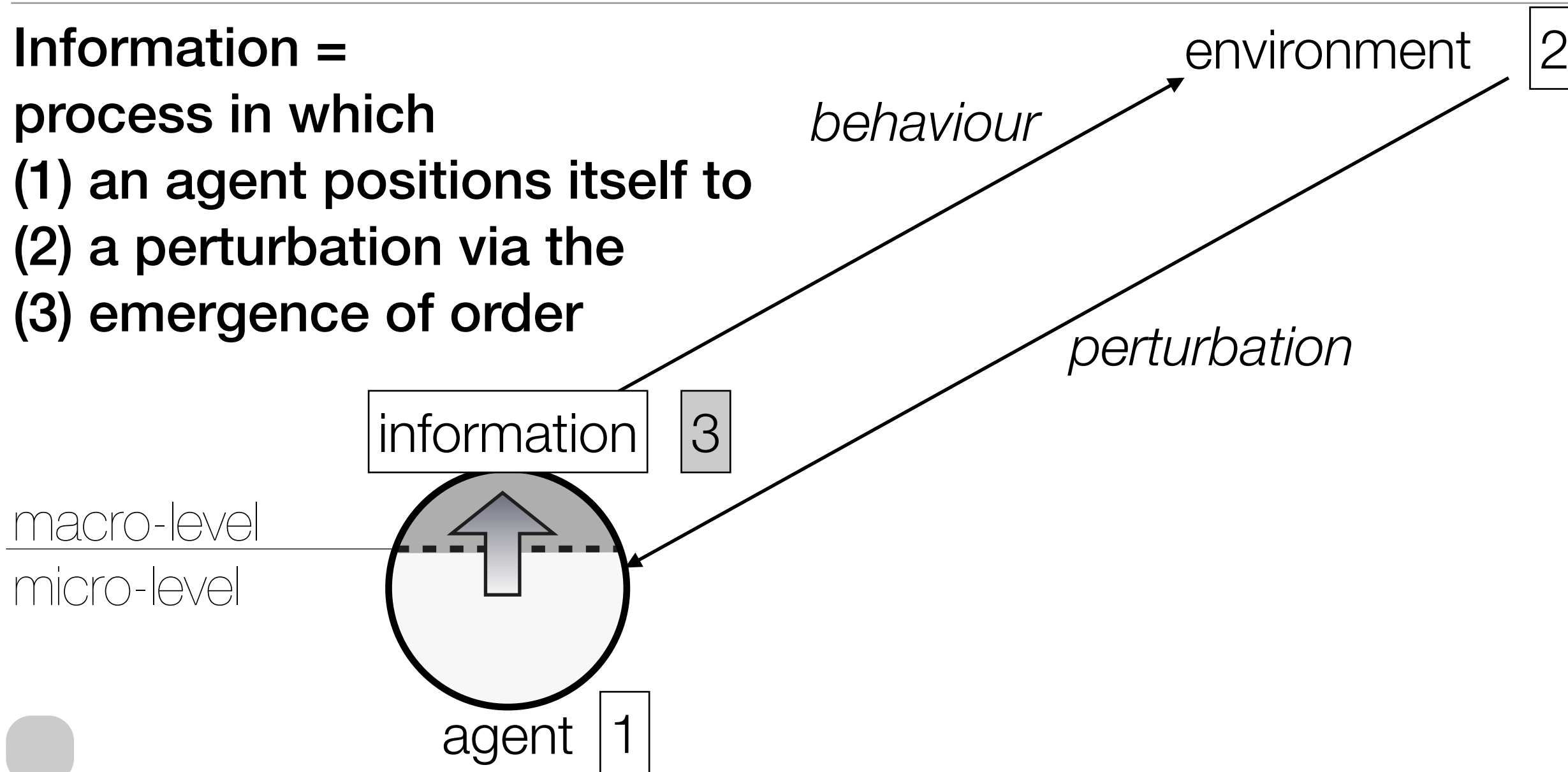
Information =
triadic relation between
(1) agential disposition
(2) environment
(3) emergent structure



self-organised order = generated/utilised information (mediator)

2.1 Emergente Information

Information =
process in which
(1) an agent positions itself to
(2) a perturbation via the
(3) emergence of order



self-organised order = generated/utilised information (mediator)

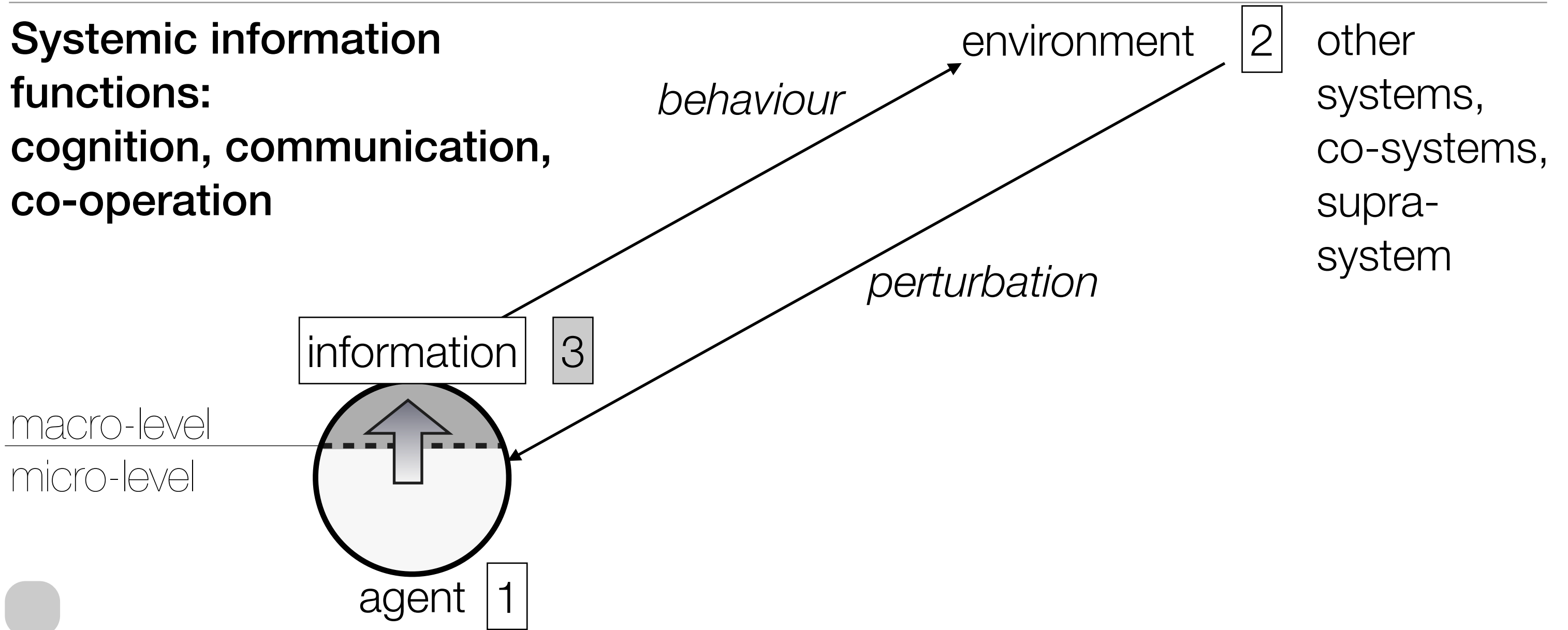
2.1.1 Kognition – Kommunikation – Kooperation

The Triple-C Model of information:

Information appears across the nested intra-, inter- and suprasystemic functions from **cognition** over **communication** to **co-operation**.

2.1.1 Kognition – Kommunikation – Kooperation

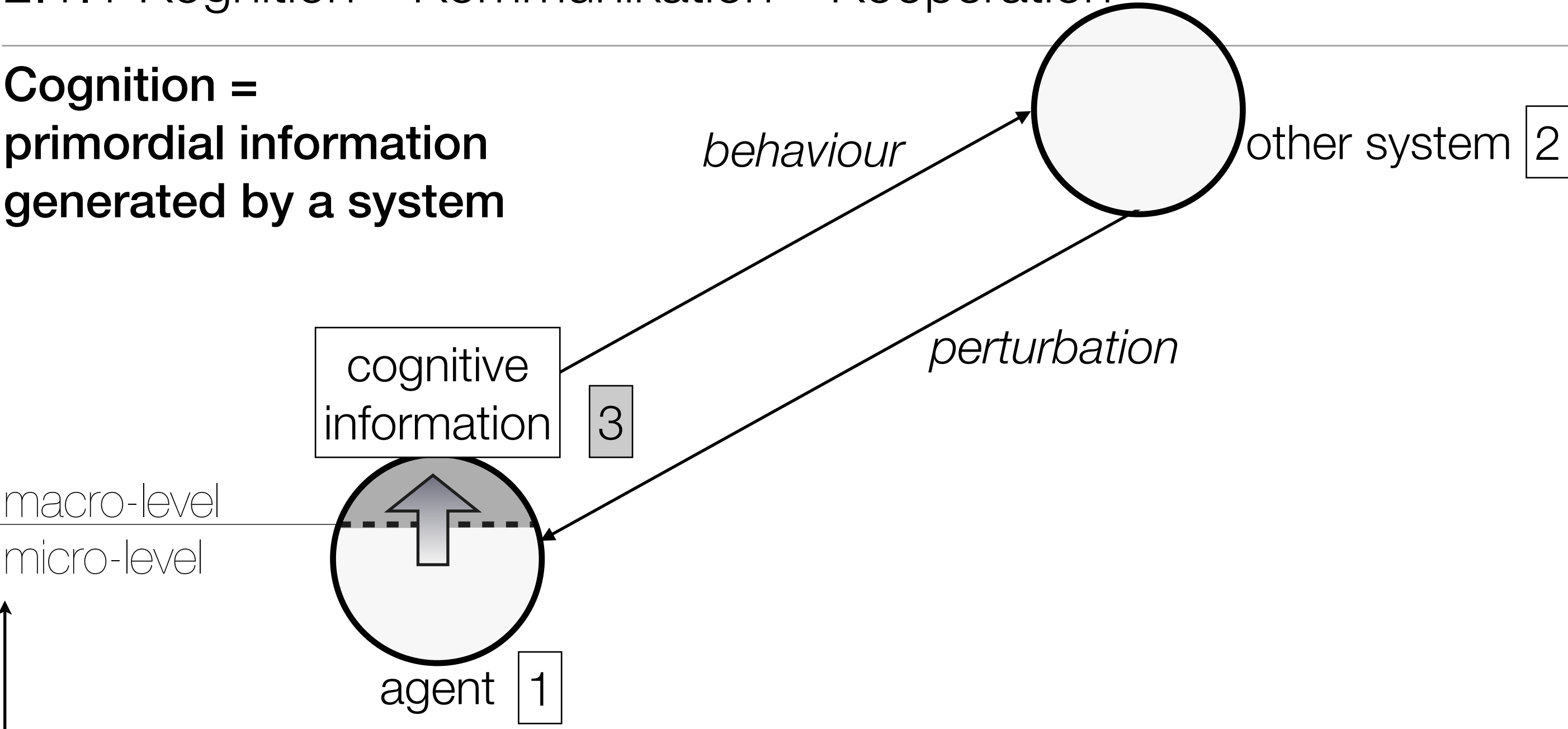
**Systemic information functions:
cognition, communication,
co-operation**



self-organised order = generated/utilised information (mediator)

2.1.1 Kognition – Kommunikation – Kooperation

Cognition = primordial information generated by a system

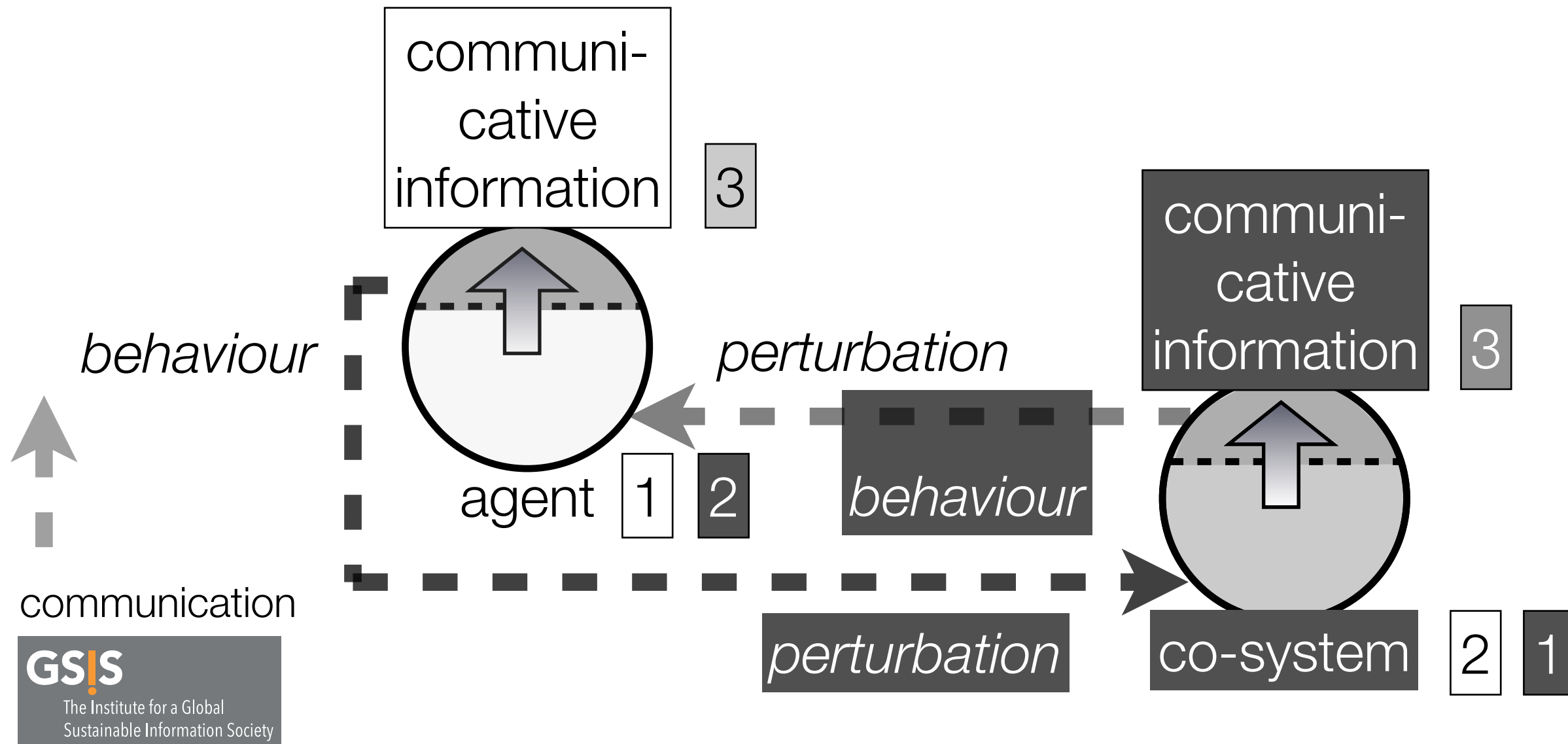


cognition



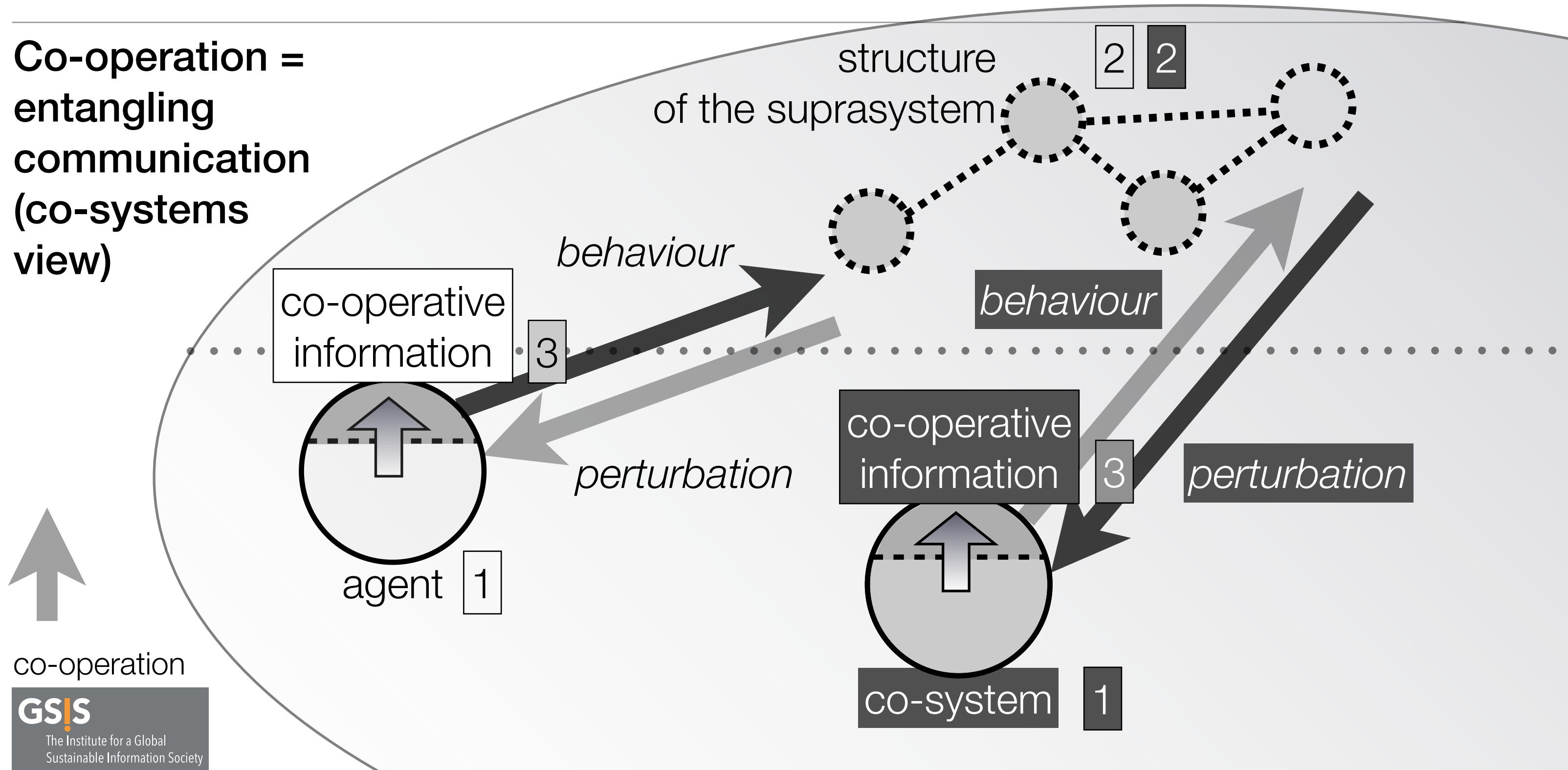
2.1.1 Kognition – Kommunikation – Kooperation

**Communication =
coupling of cognitions of co-systems**



2.1.1 Kognition – Kommunikation – Kooperation

**Co-operation =
entangling
communication
(co-systems
view)**



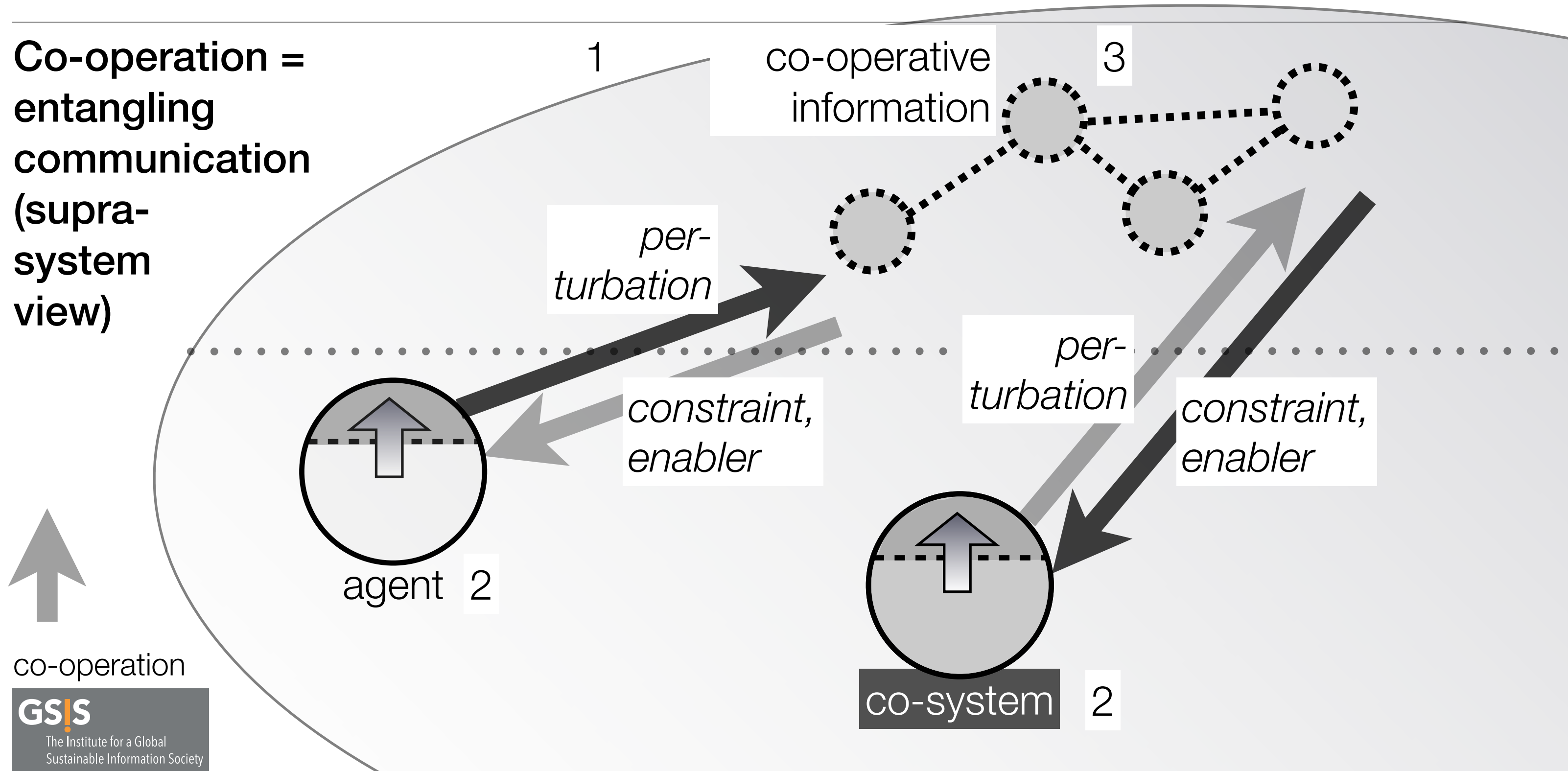
co-operation

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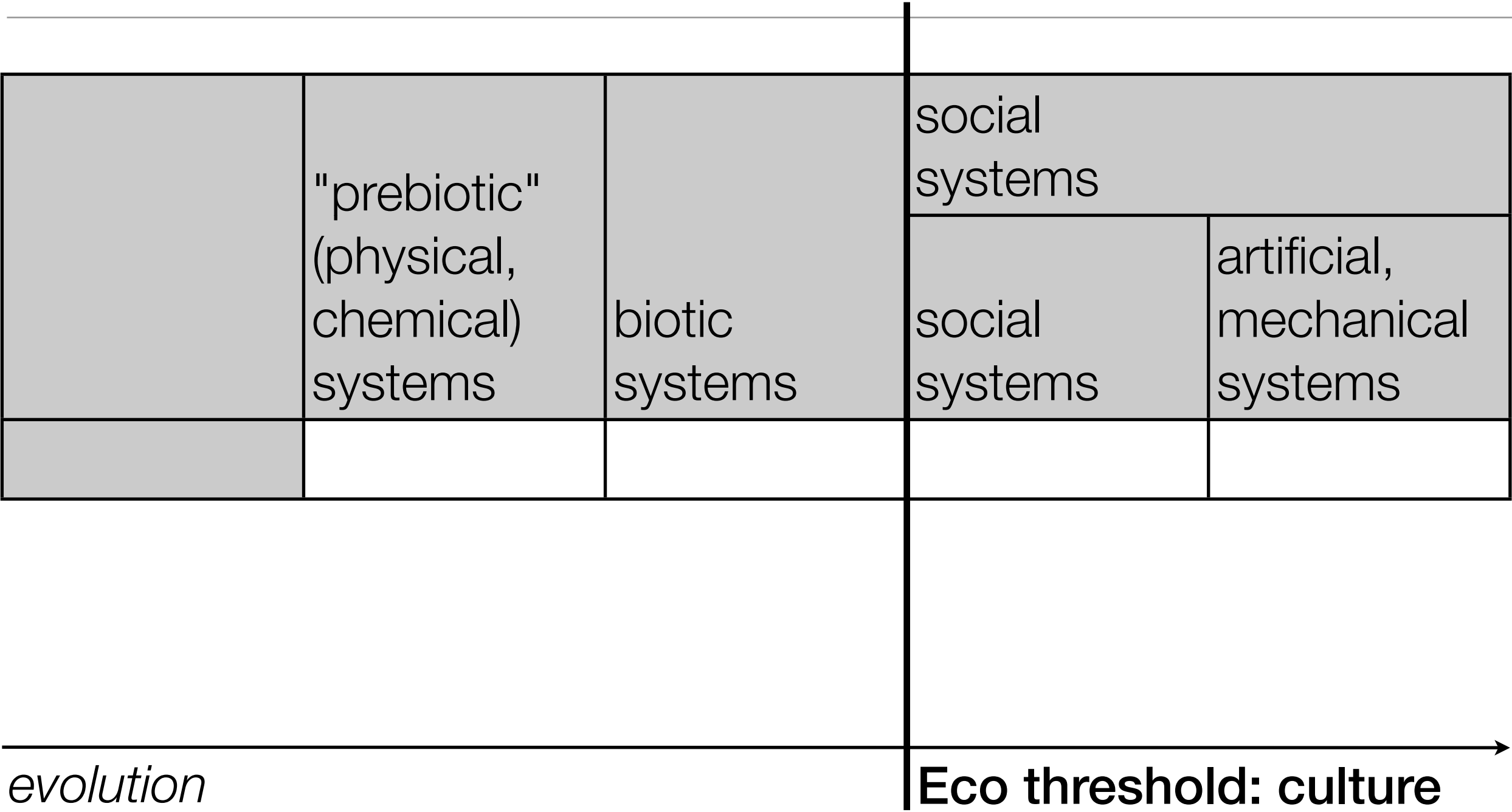


2.1.2 Physikalische, biotische und soziale Information

The Multi-Stage Model of information:

Information manifests itself along the evolutionary chain of differentiated system categories **from physical over biotic to social systems.**

2.1.2 Physikalische, biotische und soziale Information



2.1.2 Physikalische, biotische und soziale Information

	"prebiotic" (physical, chemical) systems	biotic systems	social systems	
			social systems	artificial, mechanical systems
semiotics	no	no	yes	no

evolution → **Eco threshold: culture**

2.1.2 Physikalische, biotische und soziale Information

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evolution → **Fuchs-Kittowski threshold: life**

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evolution → **Hofkirchner threshold: self-organisation**

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	"prebiotic" (physical, chemical) systems	biotic systems	social systems	artificial, mechanical systems
semiotics	no	no	yes	no
biosemiotics	no	yes	yes	no
complexity	yes	yes	yes	no

evolution → **Hofkirchner threshold: self-organisation**

2.2 Anwendungsbeispiel: Mensch–Maschine (1/7)

	"prebiotic" (physical, chemical) systems	biotic systems	social systems	artificial, mechanical systems
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biosemiotics	no	yes	yes	no
complexity	yes	yes	yes	no

evolution → **Hofkirchner threshold: self-organisation**

2.2 Anwendungsbeispiel: Mensch–Maschine (2/7)

"Man"/society is the product of

- **physical**,
- **biotic** and
- **social** evolution.

Machine is the product of "man"/society. Machines are **instruments that mediate social functions**. If so, they are **mechanical parts** (patients not agents) of social systems and turn the social systems into **techno-social systems**.

2.2 Anwendungsbeispiel: Mensch–Maschine (3/7)

	"Man"/society	machine
in physical respect	<p>as an <i>agens</i>*:</p> <ul style="list-style-type: none">• is able to organise itself, that is, to build up its own order by using free energy and dissipating used-up energy;• is made up of elements that produce organisational relations that constrain and enable synergy effects and it can take part in meta-/suprasystems;• works on the basis of less-than-strict-determinacy yielding emergence and contingency...	<p>as a <i>patiens</i>*:</p> <ul style="list-style-type: none">• cannot self-organise;• is made up of modules that are connected in a mechanical way;• is strictly deterministic, not emergent nor contingent...

2.2 Anwendungsbeispiel: Mensch–Maschine (4/7)

	"Man"/society	machine
in biotic respect	<p>as an autonomous agent:</p> <ul style="list-style-type: none">• is able to maintain its organisational relations by the active provision of free energy;• can make choices according to its embodiment, its embedding in its natural environment and the network of conspecifics;• tries to control other systems by catching up with their complexity...	<p>as an heteronomous mechanism:</p> <ul style="list-style-type: none">• cannot maintain itself;• cannot choose;• cannot catch up with complexity, is under control of the organism...

2.2 Anwendungsbeispiel: Mensch–Maschine (5/7)

	"Man"/society	machine
in social respect (1)	<p>as an actor (a social agent):</p> <ul style="list-style-type: none">• is, in essence, the ensemble of the social relations* that emerged from a change in co-operation of its animal ancestors;• is element of social systems that provide the commons as social synergy effects;• constitutes social agency (action, interaction and co-action with other actors) that reproduces and transforms (enact) the social structure (social relations) that, in turn, enables and constrains social agency;	<p>as artefact:</p> <ul style="list-style-type: none">• is constructed;• pertains to the commons;• does not act itself but supports action, inter- and co-action, is not directly causative;

2.2 Anwendungsbeispiel: Mensch–Maschine (6/7)

	"Man"/society	machine
in social respect (2)	<ul style="list-style-type: none">• is the driving force of social evolution, including the evolution of culture, polity, economy, ecology, technology;• can attempt to set off the transition into actuality of an option of choice out of the field of possibilities;• can reflect upon the social relations so that „I“ and „thou“ become „me“ and „thee“ by mediation of „us“ as the third that is „we“ as reflected from „me“ and „thee“ ...	<ul style="list-style-type: none">• is driven by social evolution;• does not directly trigger emergence;• cannot reflect relationally...

2.2 Anwendungsbeispiel: Mensch–Maschine (7/7)

- **Conclusion:**

Anyway, if technology surpasses the performance of specific human activities, it does, in principle, **extend human capabilities**.

– It does not make sense to compare human capabilities and technical affordances in order to search for similarities. They are **essentially different**.

2.3 Anwendungsbeispiel: Zukunft der Menschheit (1/7)

	"prebiotic" (physical, chemical) systems	biotic systems	social systems	
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evolution → **Hofkirchner threshold: self-organisation**

2.3 Anwendungsbeispiel: Zukunft der Menschheit (2/7)

After two leaps of quality in the becoming of humankind, **another leap is in reach.**

2.3 Anwendungsbeispiel: Zukunft der Menschheit (3/7)

Joint intentionality* – first step to anthro(socio)genesis:

- **early humans**, hunter and gatherers (about 400.000 yrs ago)
- **dyadic** co-operation, driven by "**second-person morals**" (agreements for a common way of exploiting food sources of at least two partners)
 - acceleration of biotic evolution through insertion of "social" factors (co-operation partners were evaluated)
- **a need for acknowledging a common goal**, that is, understanding that the partner shares the goal, and that both are committed to act according to its achievement

2.3 Anwendungsbeispiel: Zukunft der Menschheit (4/7)

Collective intentionality* – second step to anthro(socio)genesis:

- **early humans** (about 150.000 to 100.000 yrs ago)
- **triadic** co-operation, driven by "**objective morals**" (bigger groups)
 - social evolution has become dominating biotic evolution since
- **a need for group thinking**, that is, knowing that any person belonging to the same group culture can be expected to share same values
 - by **constructing a meta-level** any group member can imagine the whole of the group, the roles taken, her own as well as others' replaceability

2.3 Anwendungsbeispiel: Zukunft der Menschheit (5/7)

Universally shared intentionality – a possible third step to anthropo(socio)genesis:

- **humans in the age of global challenges** (since about WW II)
- **"omniadic"** (all-encompassing) co-operation, driven by **concerns to cope with global challenges** (all mankind)
 - social evolution lags behind the complexity of its own achievements
- **a need for anticipating future social relations** that catch up with the complexity of global challenges
 - by **"visioneering"*** those relations humanity can succeed

2.3 Anwendungsbeispiel: Zukunft der Menschheit (6/7)

Co-operative information imperative

space of co-operation possibilities 1

interpersonal dyads*

tribal myths

space of co-operation possibilities 2

cultural triads* (morals)

intracultural dyads

civilisational ideologies

convivial** omniad?

transcultural*** triads?

cosmopolitan dyads?

global consciousness?

integration levels

*world ethos**** (universal sharedness)?*

sense of community (collectivity*)

collegiality (jointness*)

differentiation phases

2.3 Anwendungsbeispiel: Zukunft der Menschheit (7/7)

- **Conclusion:**

We need a **leap in co-operation to a higher level**. Without attempts for such a leap, we cannot make technologies into **tools for conviviality***.

– It's wrong to hope for trans- or posthumans. It's a **Global Sustainable Information Society**, we should build up instead.

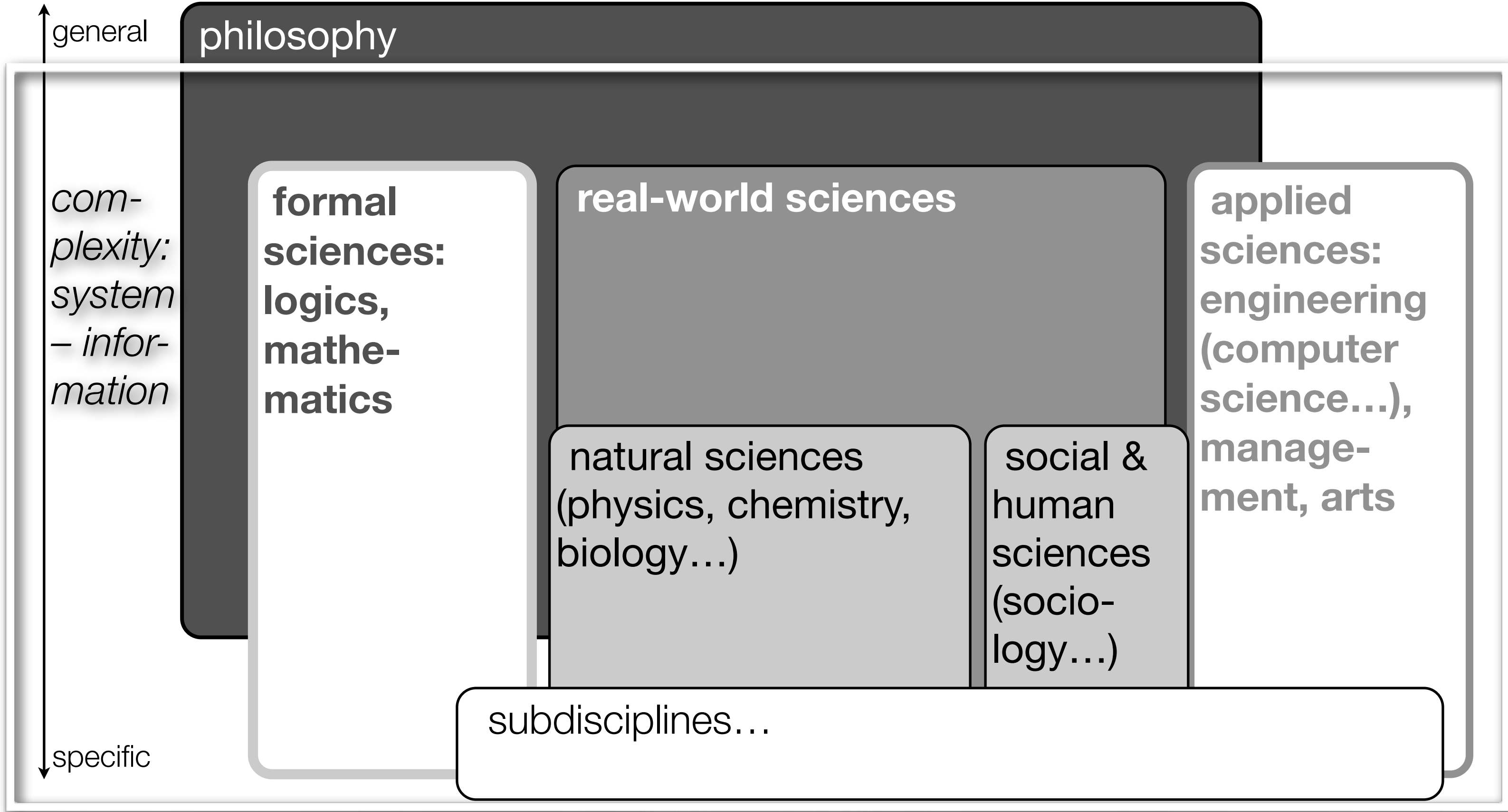
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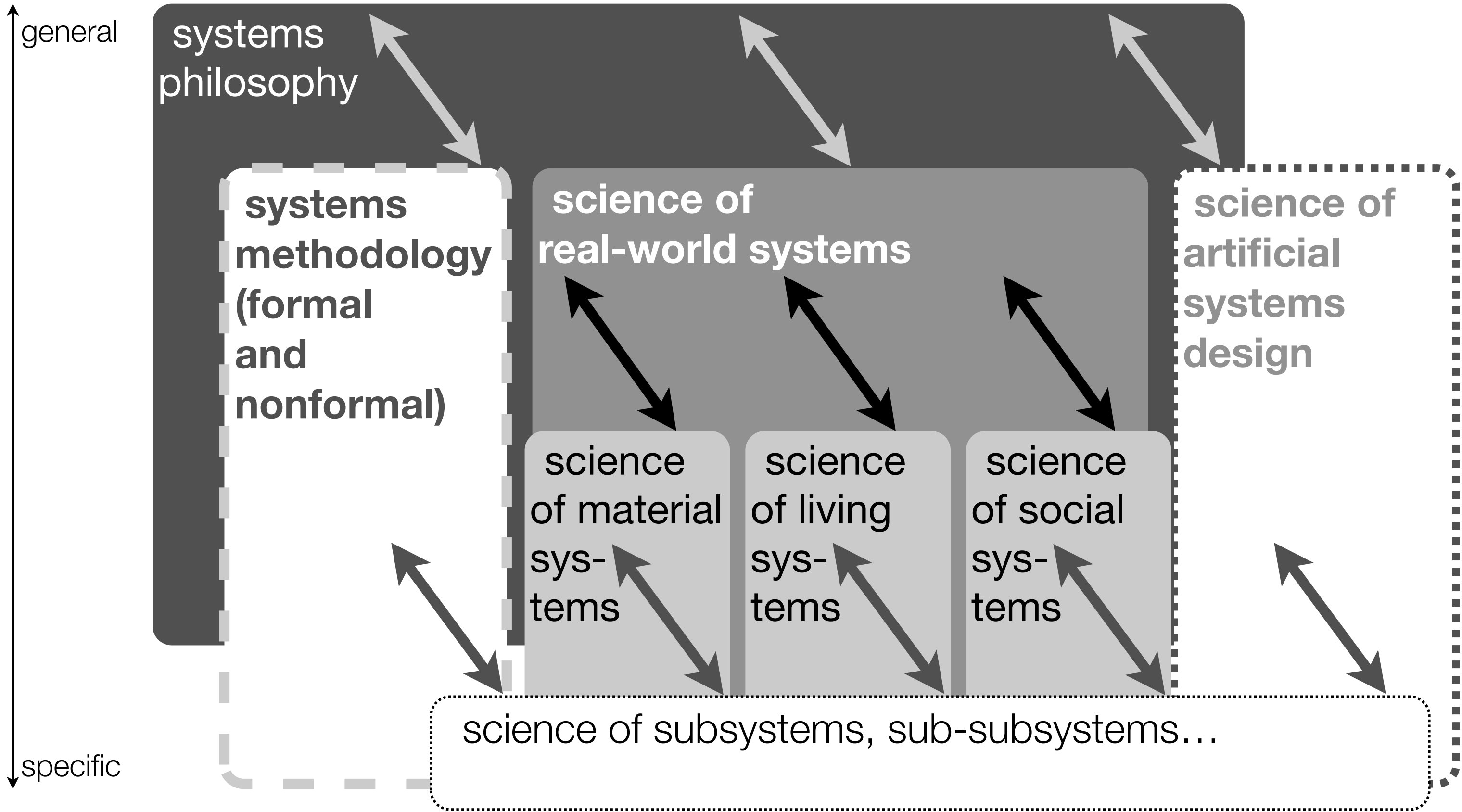
Systems thinking and the informational perspective reconceptualise the edifice of science(s):

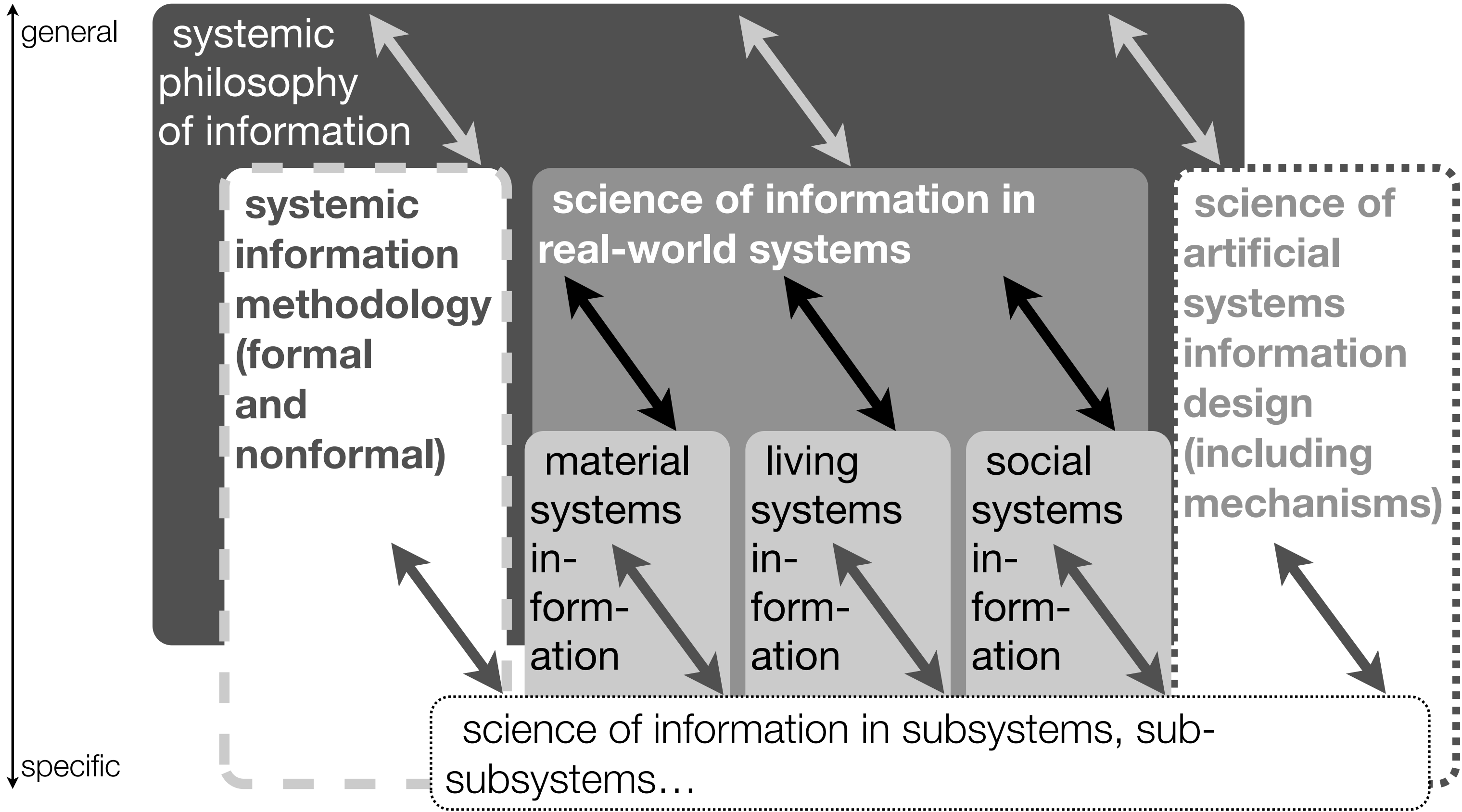
Anything can be framed, modelled and designed

– in a **systemic** way, that is, as a **system** (or in the context of the dynamics or the architecture of systems), and, since self-organising systems are information-generating systems,

– in an **informational** way, that is, as an **informational agent** (or in the context of the dynamics or the architecture of informational agents), as well; each according to their **evolutionary stage**.







3 Die Transdisziplinarität einer "Wissenschaft von der Information"

Conclusion:

- On the basis of **UTI** (systemic informationism), **Science of Information** can **cross diverse disciplines** and **transcend them upwards to metalevels for unification** in order to flesh out the theoretical specification hierarchy of empirical information manifestations:
 - the disciplinary borders can become **permeable** and
 - the lower and higher levels can enter a **bottom-up and top-down loop** so as to be open to adopting changing findings and insights when attempting a consistent picture of the whole.

Danke.

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