Emergent information.
The quest for a unified theory

Simulation komplexer Systeme, Jour fixe, IWK, Wien, 24.1.2013

Wolfgang Hofkirchner

Contents

0 My basic assumptions

In general terms,

1. praxiologically, humans want to/shall **intervene in the world to make it a better one**;

2. ontologically, intervention needs to consider the **totality of being**.
   – **Dialectic: the real world exists as wholes of interrelated results of processes**;

3. epistemologically, the totality of being can be **approximated through constructing social information**.

0 My basic assumptions

In systems terms,

1. praxiologically, humans want to/shall **design systems for humane ends**;

2. ontologically, design needs to consider the **complex nature of existents**. – **Systemism: every existent/emergent is (part of) a system or system dynamics**;

3. epistemologically, the complex nature of existents **can, step by step, be understood by systems thinking**.

1 Where and when did/does information emerge?

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

evolution,
increase in complexity

Eco threshold: culture

1 Where and when did/does information emerge?

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

evolution, increase in complexity

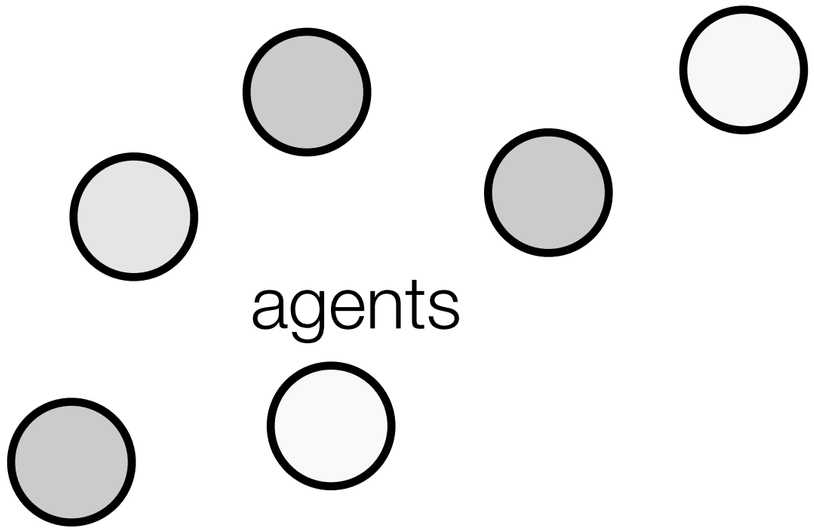
Fuchs-Kittowski threshold: life

1 Where and when did/does information emerge?

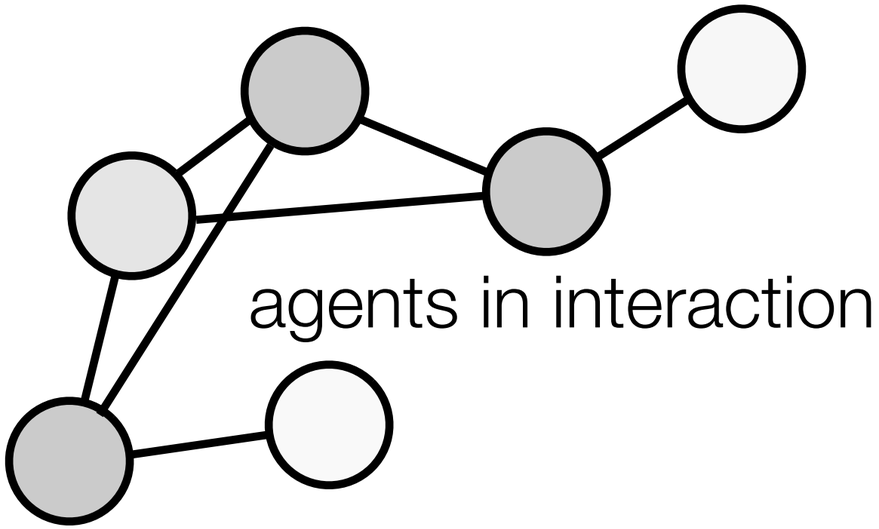
	"prebiotic" (physical, chemical) systems	biotic systems	social systems	
			social systems	artificial, mechanical systems
semiotics	no	no	**yes**	no
biosemiotics	no	**yes**	**yes**	no
complexity	**yes**	**yes**	**yes**	no

evolution, increase in complexity → **Hofkirchner threshold: self-organisation**

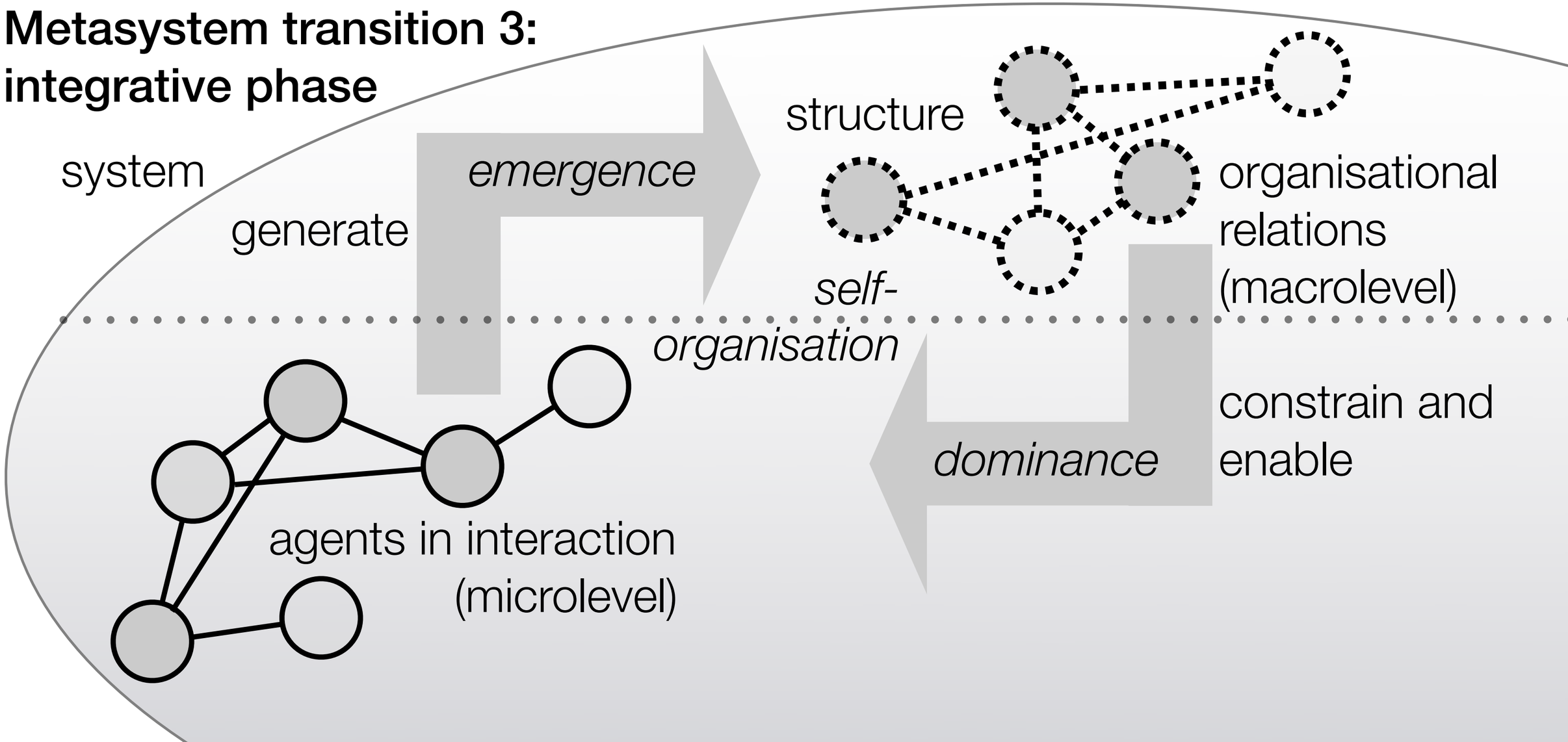
Metasystem transition 1: individual phase

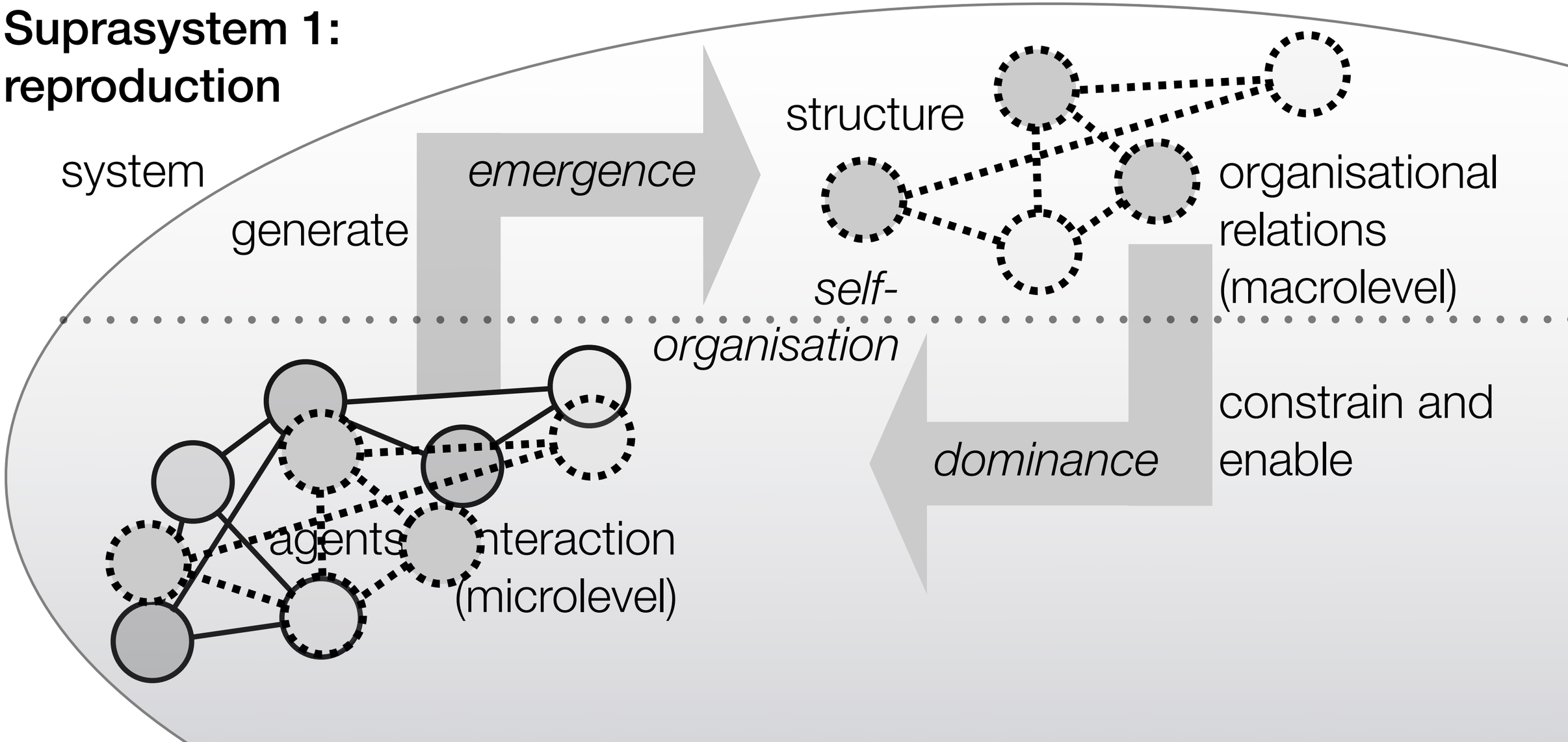


Metasystem transition 2: interactional phase

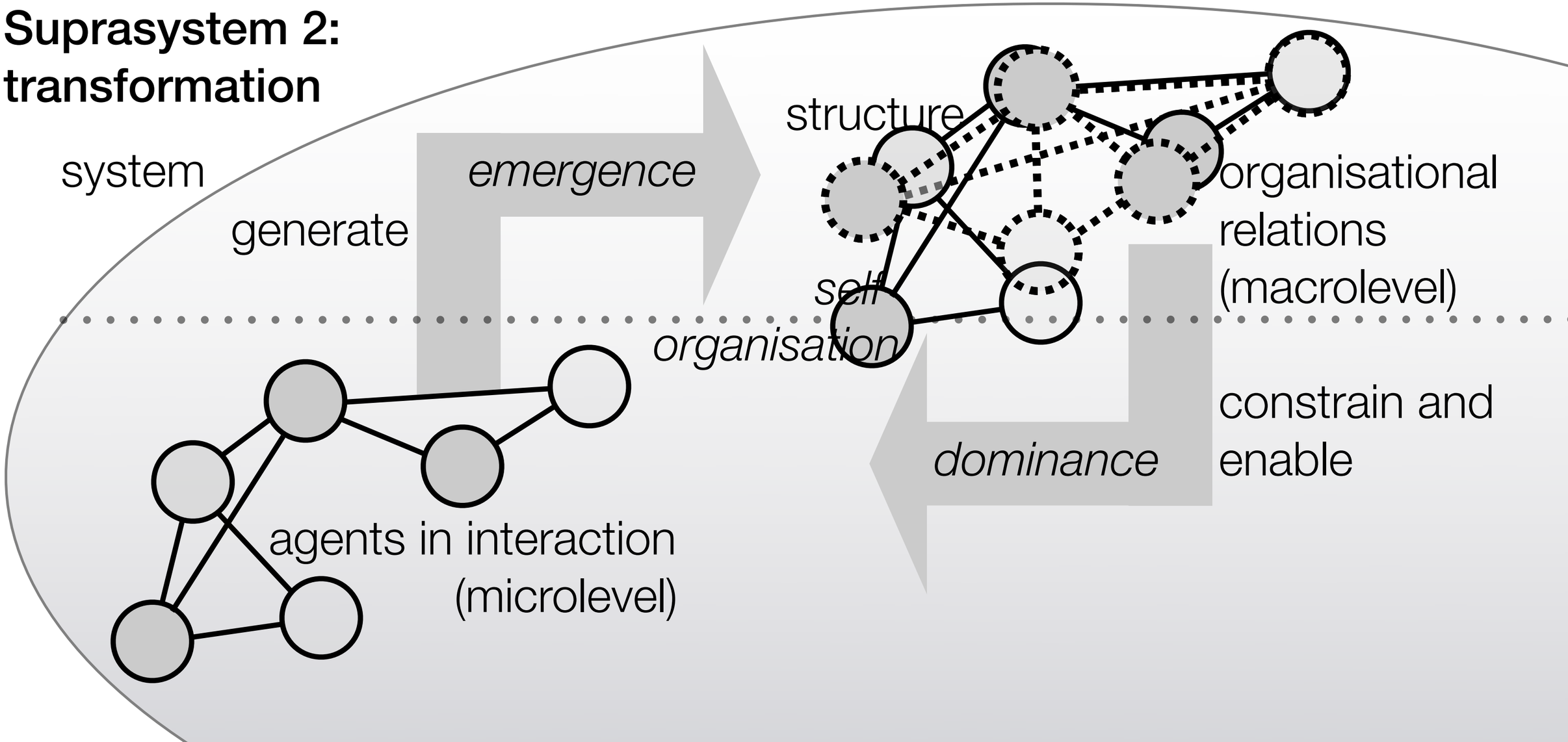


Metasystem transition 3: integrative phase



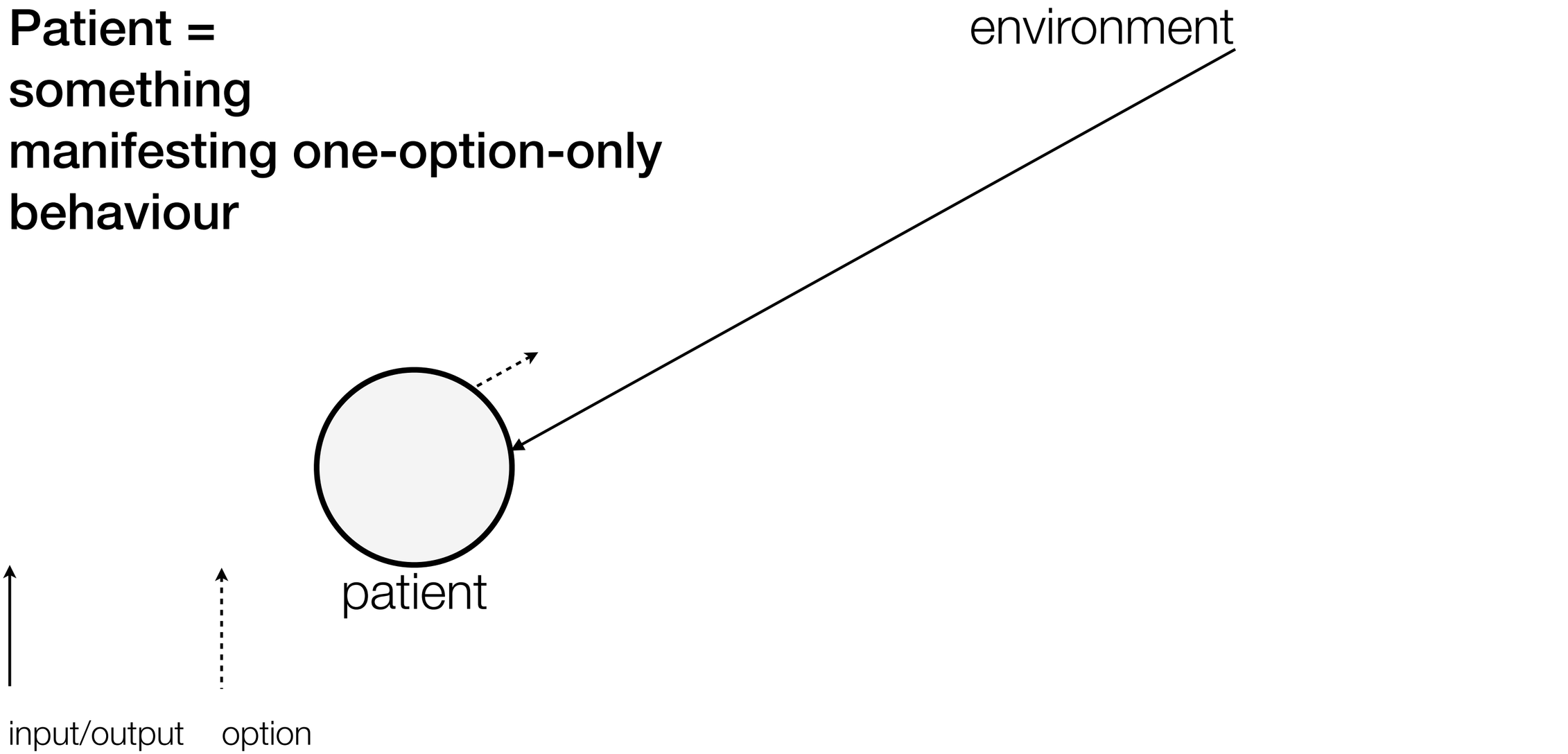

Suprasystem 1:
reproduction
system
generate
emergence
structure
organisational
relations
(macrolevel)
self-
organisation
constrain and
enable
dominance
agents
nteraction
(microlevel)

Suprasystem 2: transformation



3 What is information?

Patient =
something
manifesting one-option-only
behaviour



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Patient =
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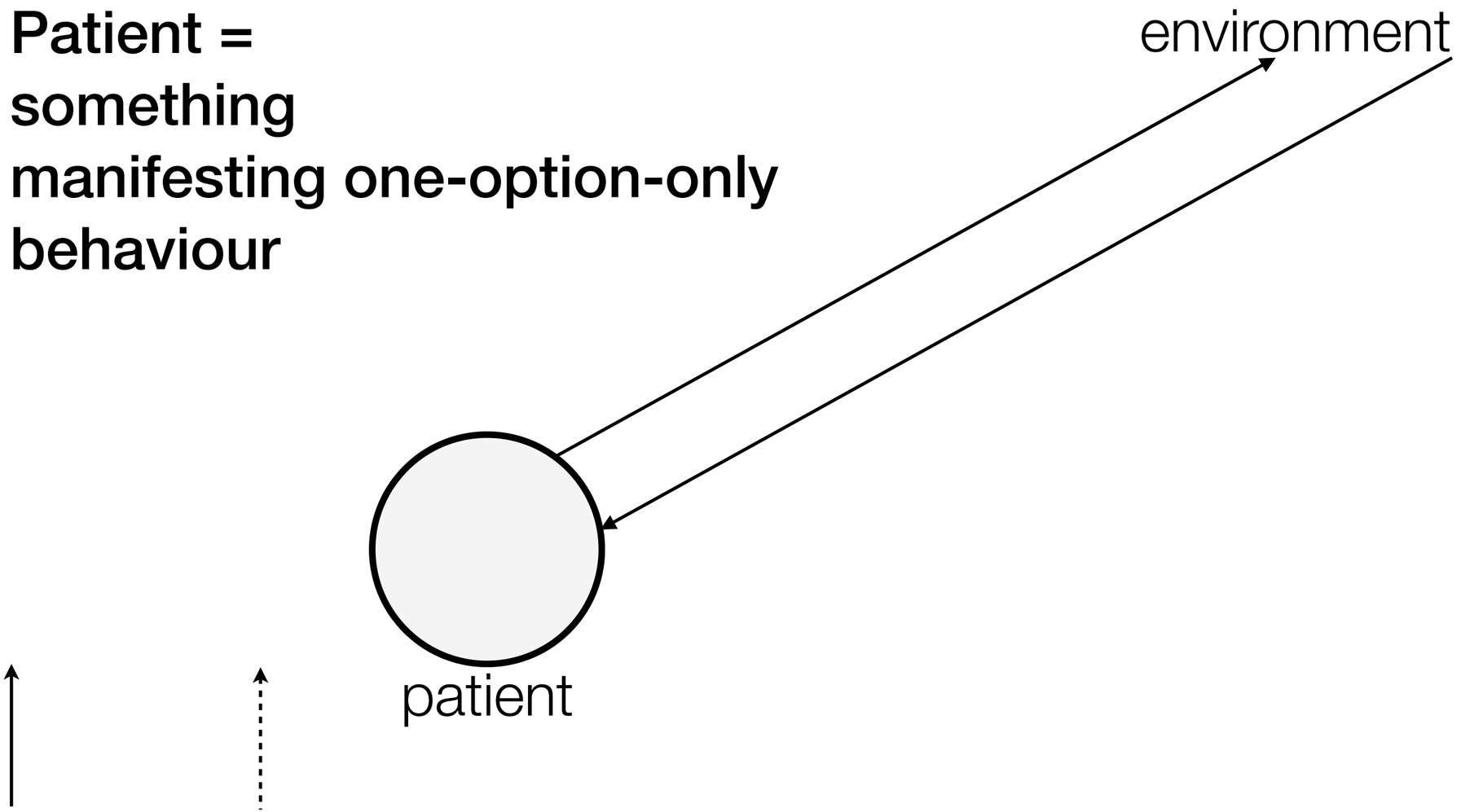
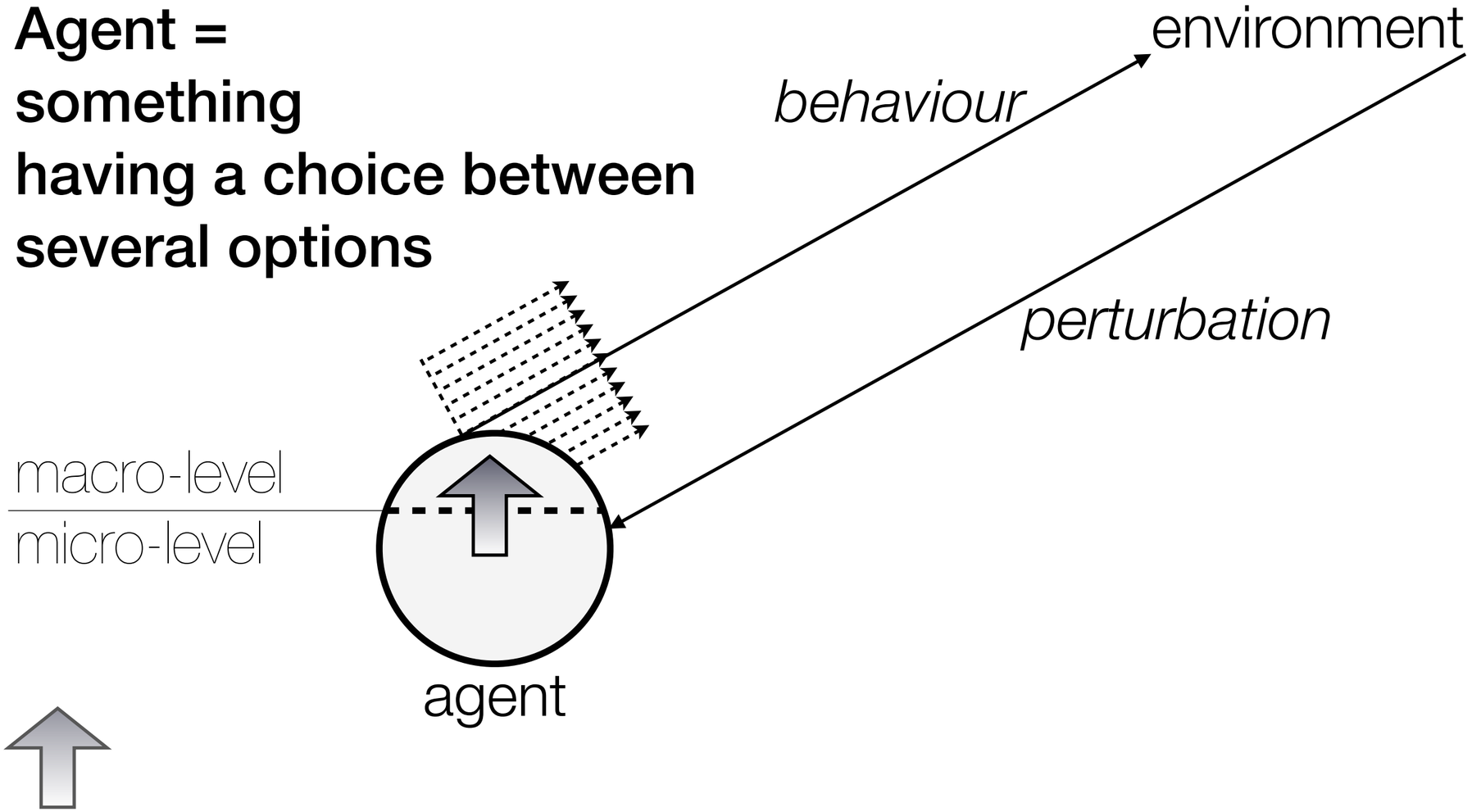


3 What is information?

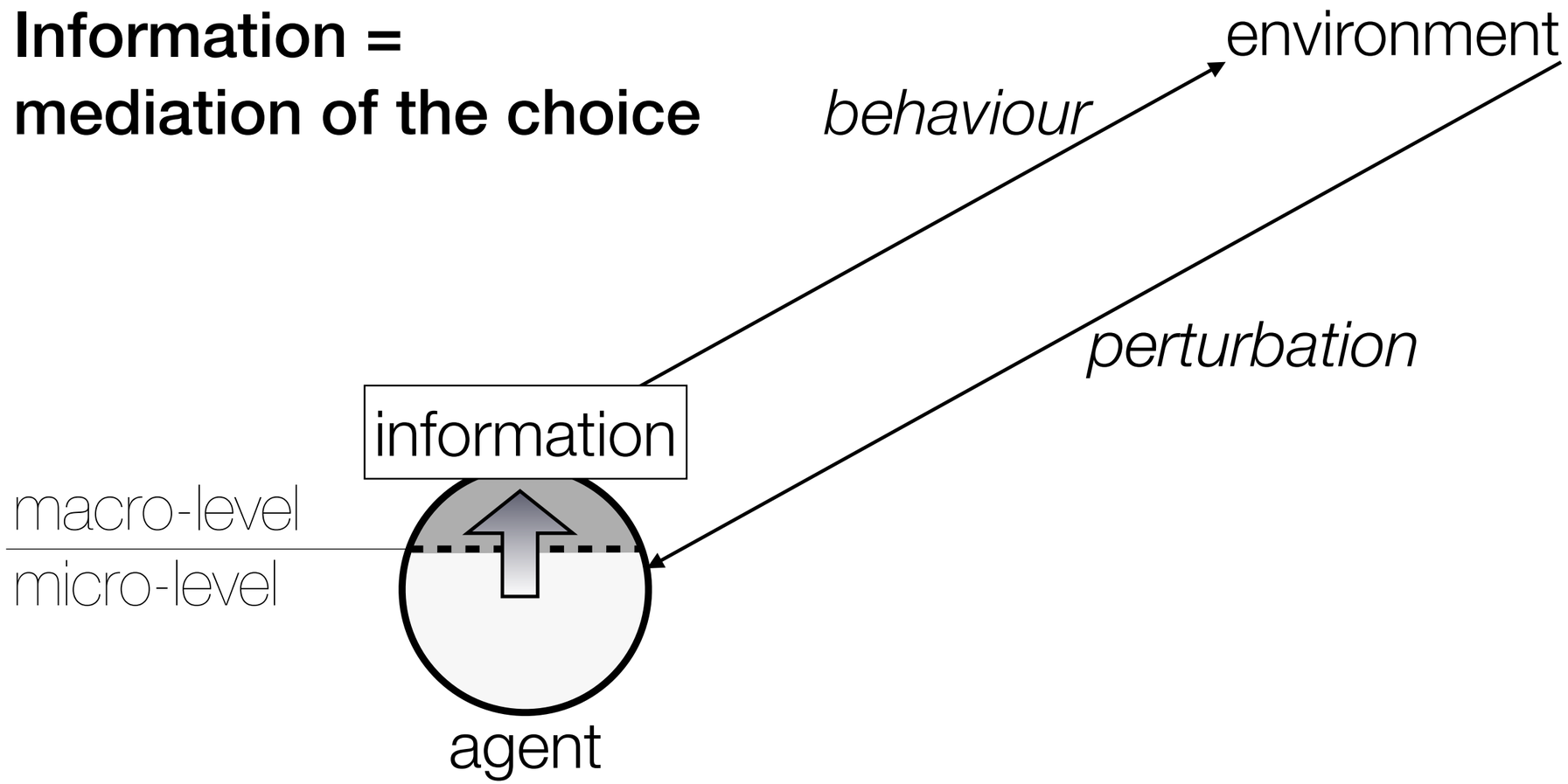
Agent =
something
having a choice between
several options



self-organisation

3 What is information?

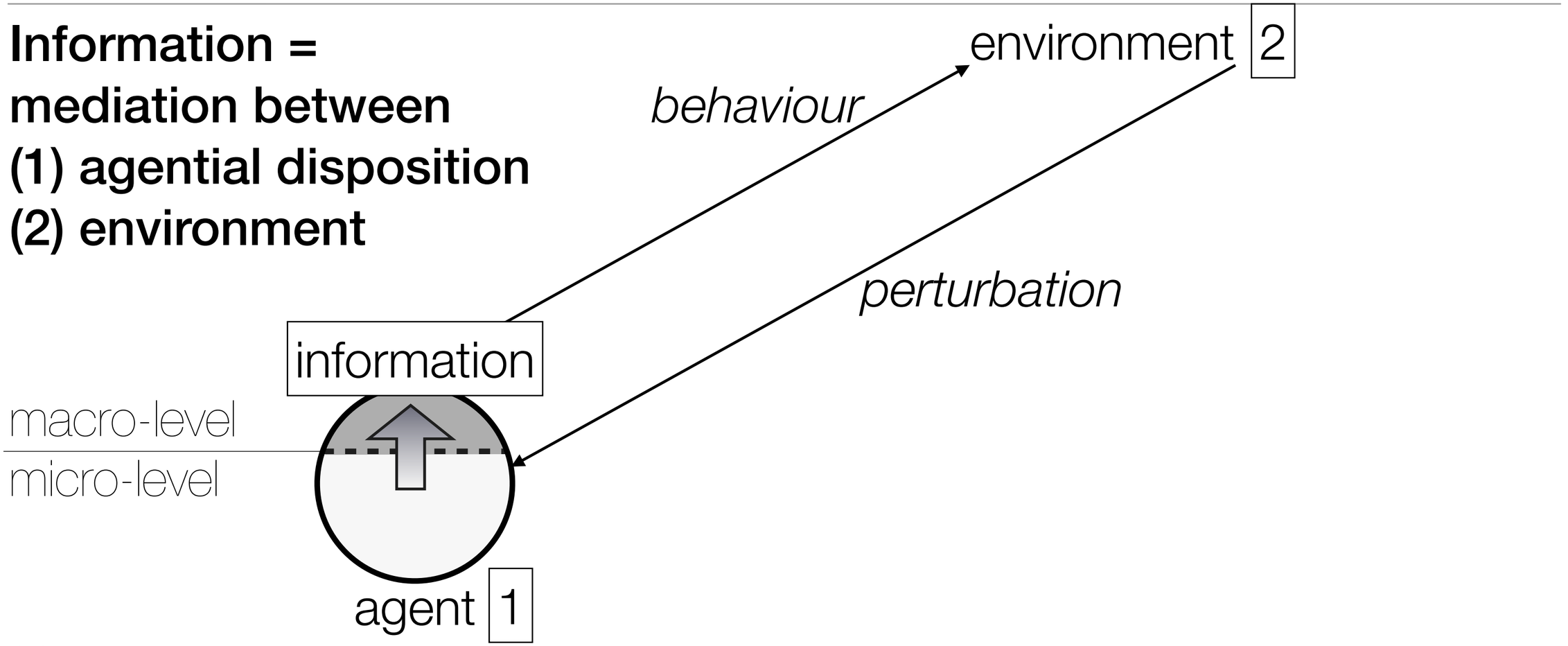
Information =
mediation of the choice



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

3 What is information?

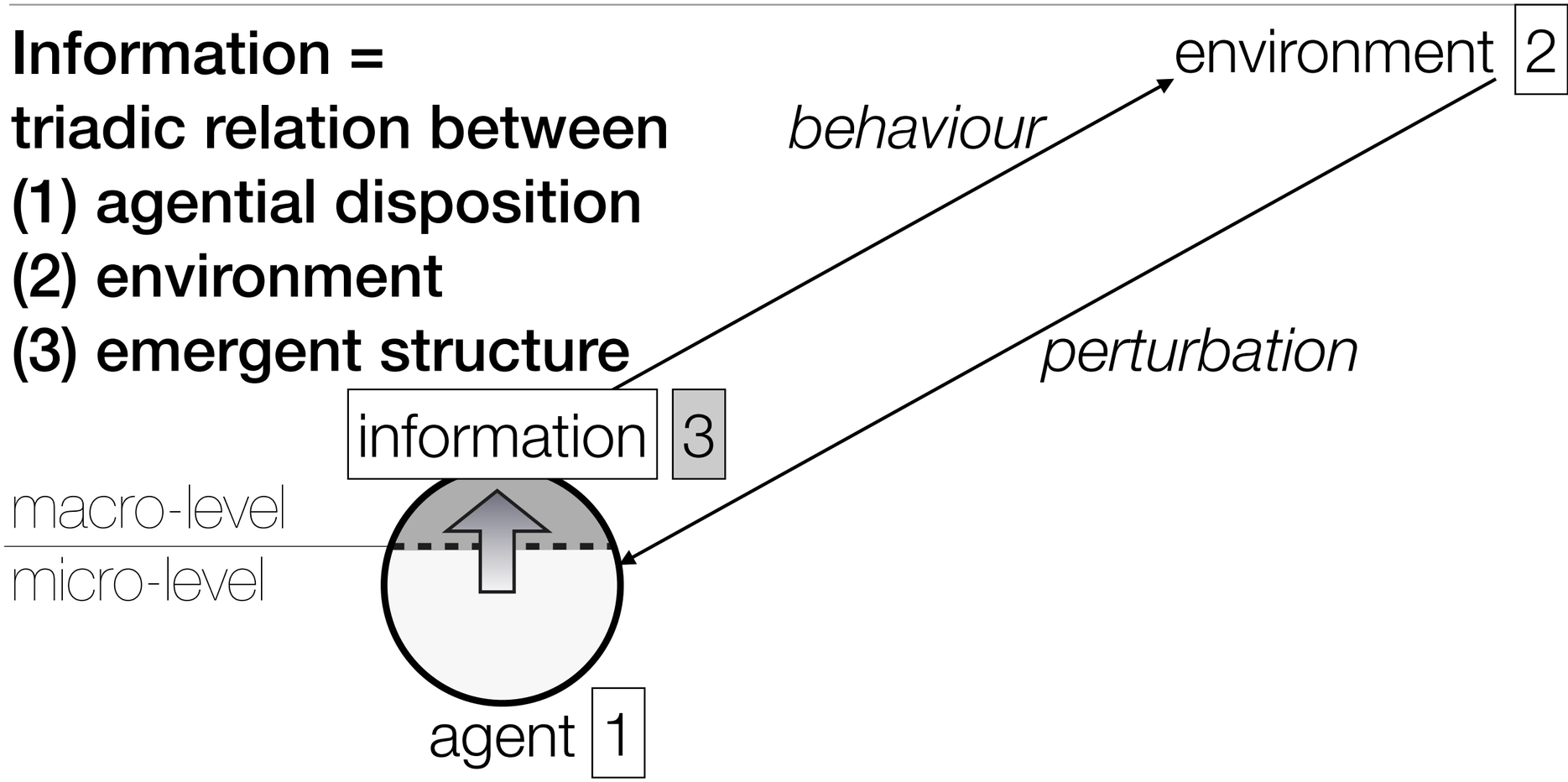
Information =
mediation between
(1) agential disposition
(2) environment



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

3 What is information?

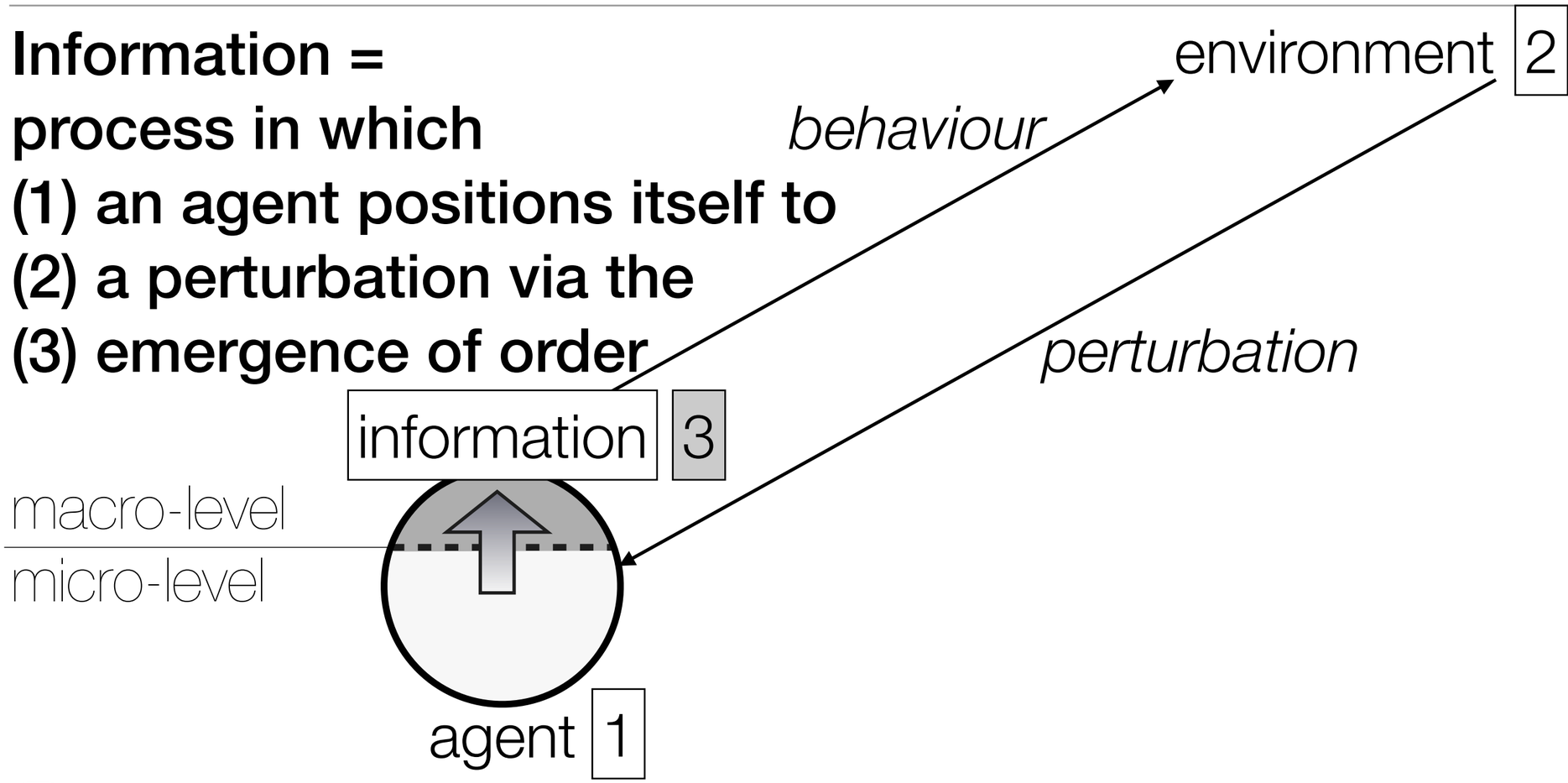
Information =
triadic relation between
(1) agential disposition
(2) environment
(3) emergent structure



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

3 What is information?

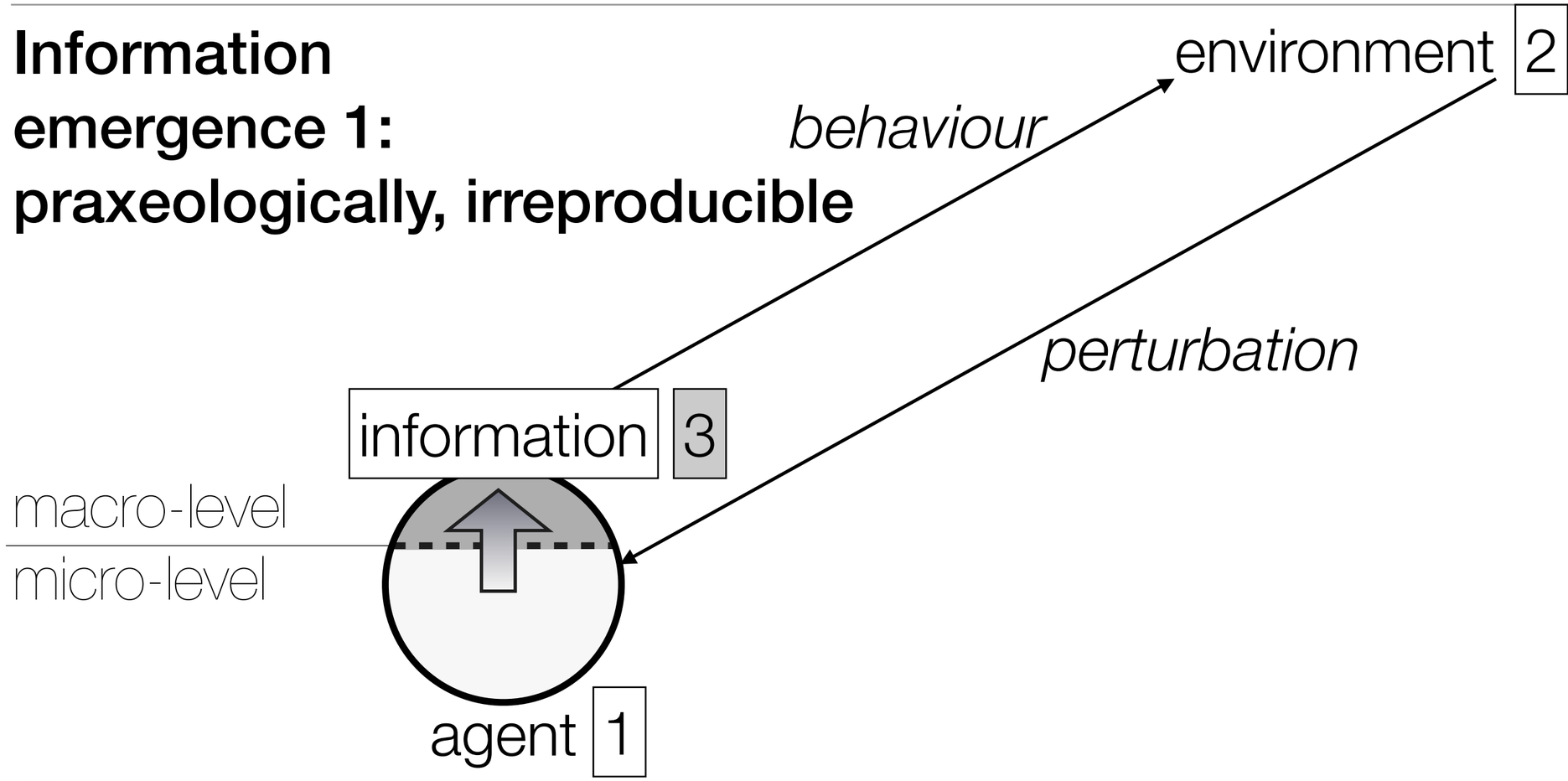
Information =
process in which
(1) an agent positions itself to
(2) a perturbation via the
(3) emergence of order



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

3 What is information?

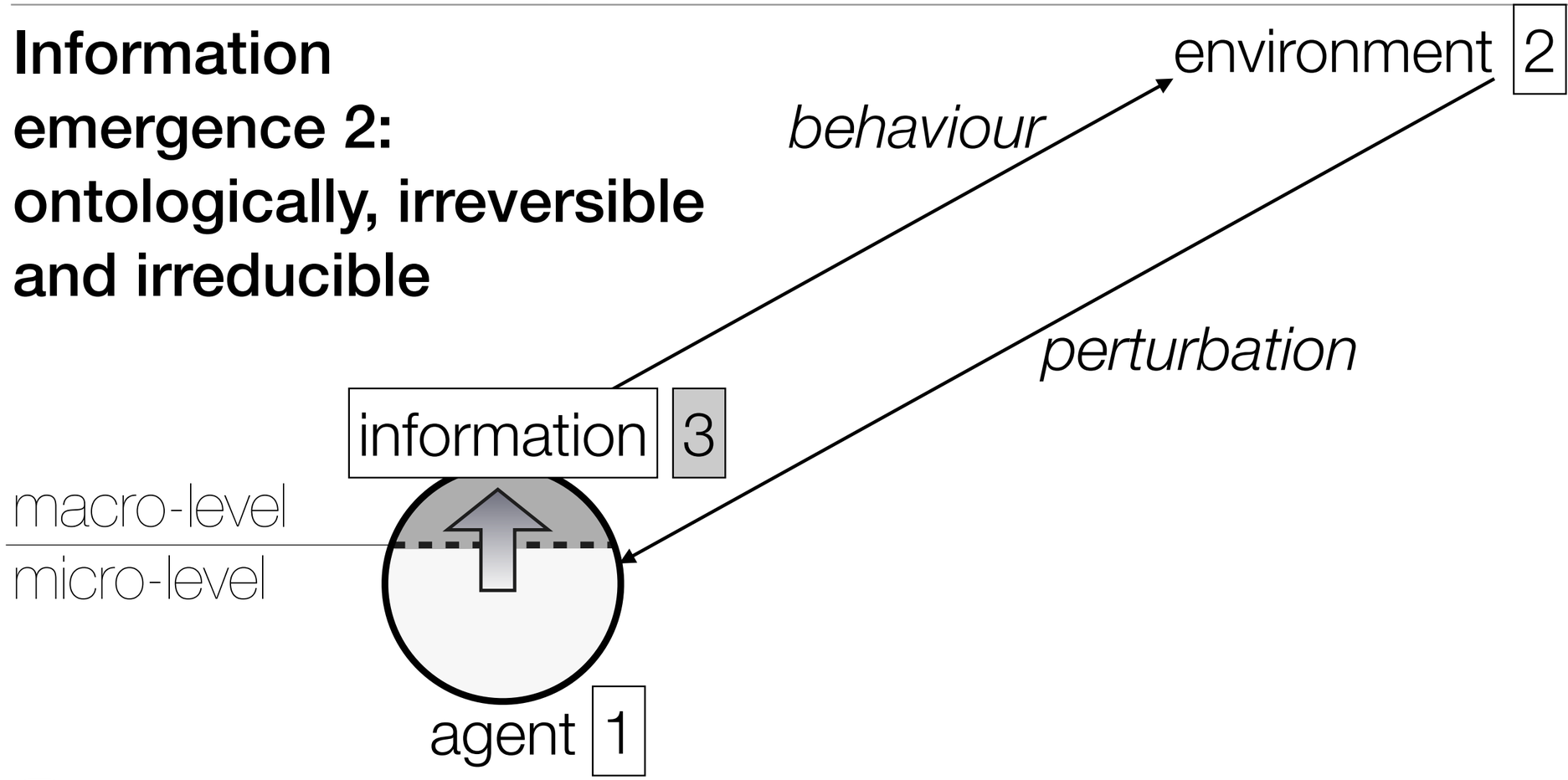
Information emergence 1: praxeologically, irreproducible



self-organised order = generated/utilised information = emergent

3 What is information?

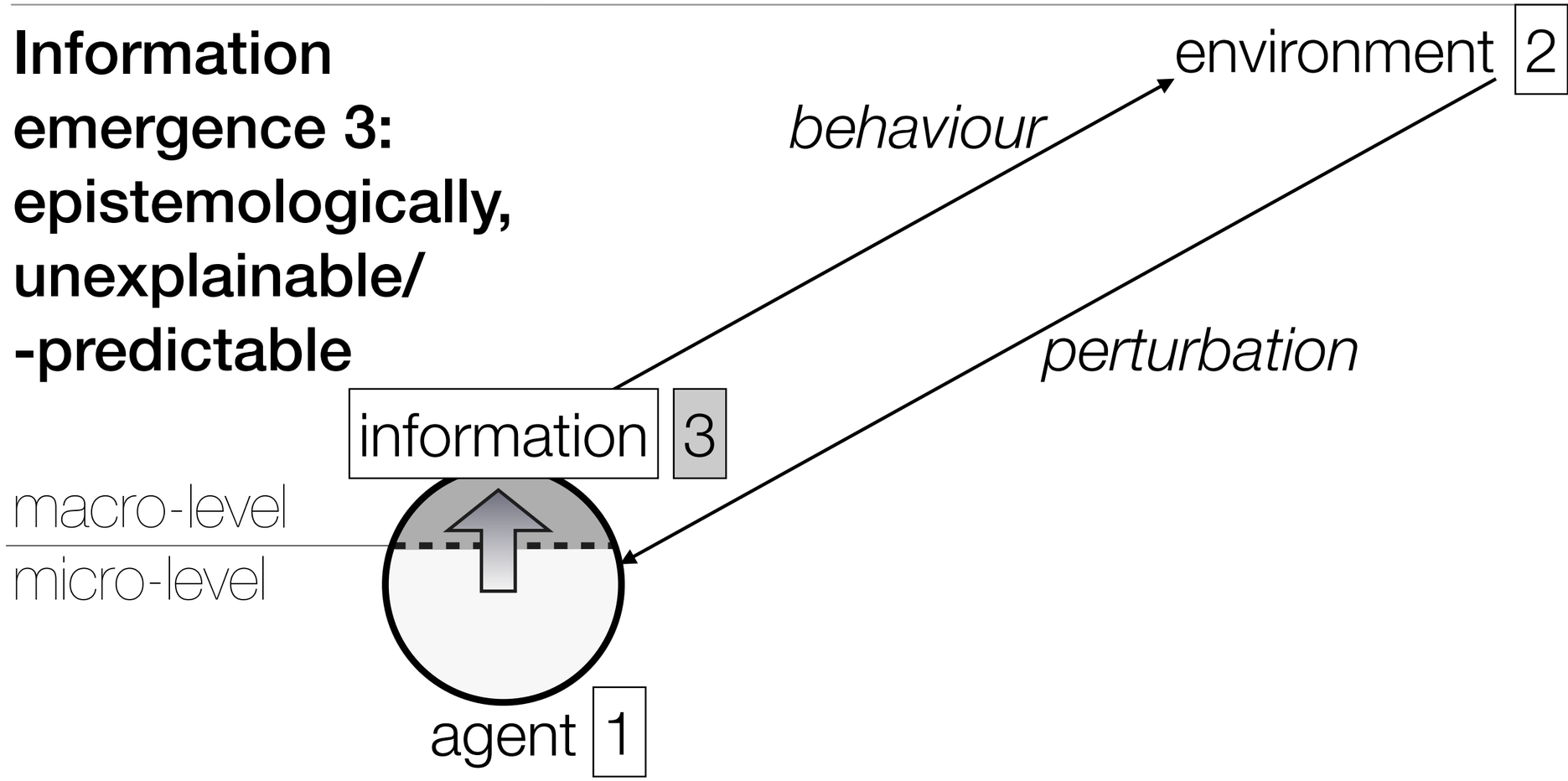
Information emergence 2: ontologically, irreversible and irreducible



self-organised order = generated/utilised information = emergent

3 What is information?

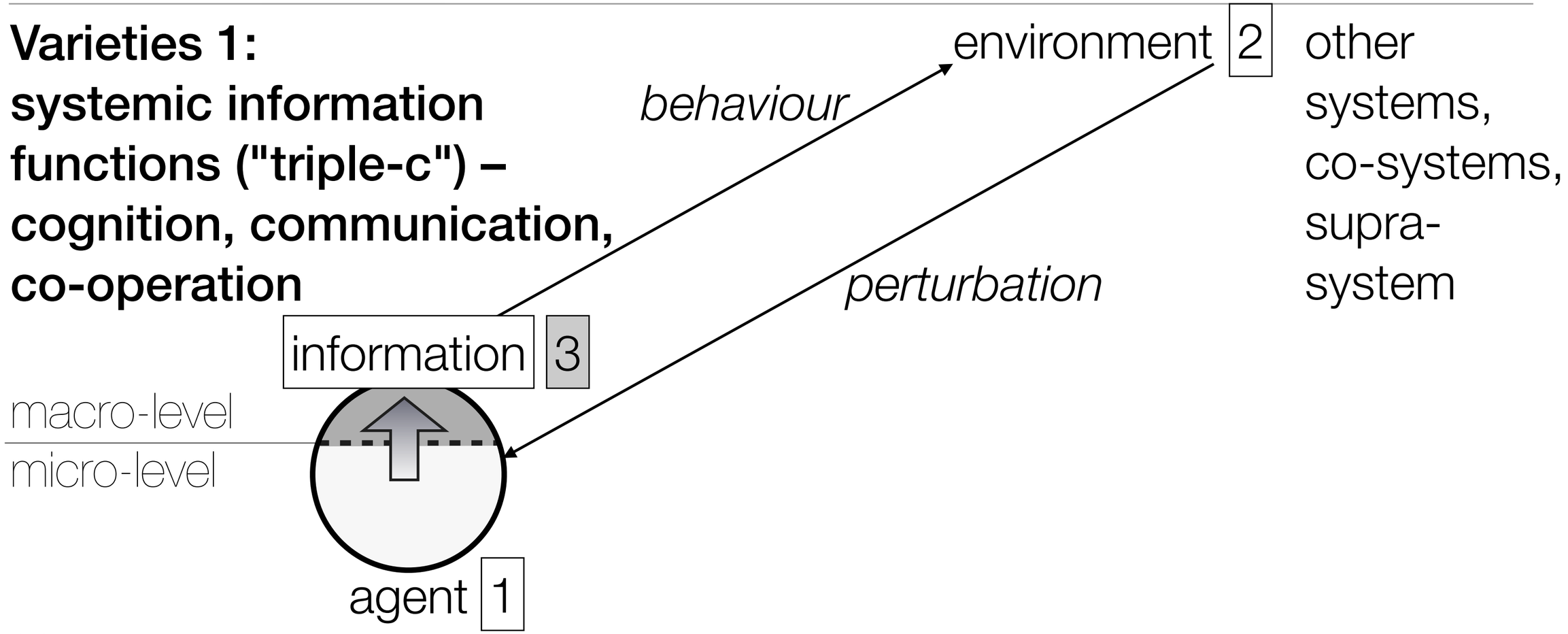
Information emergence 3: epistemologically, unexplainable/ -predictable



self-organised order = generated/utilised information = emergent

3 What is information?

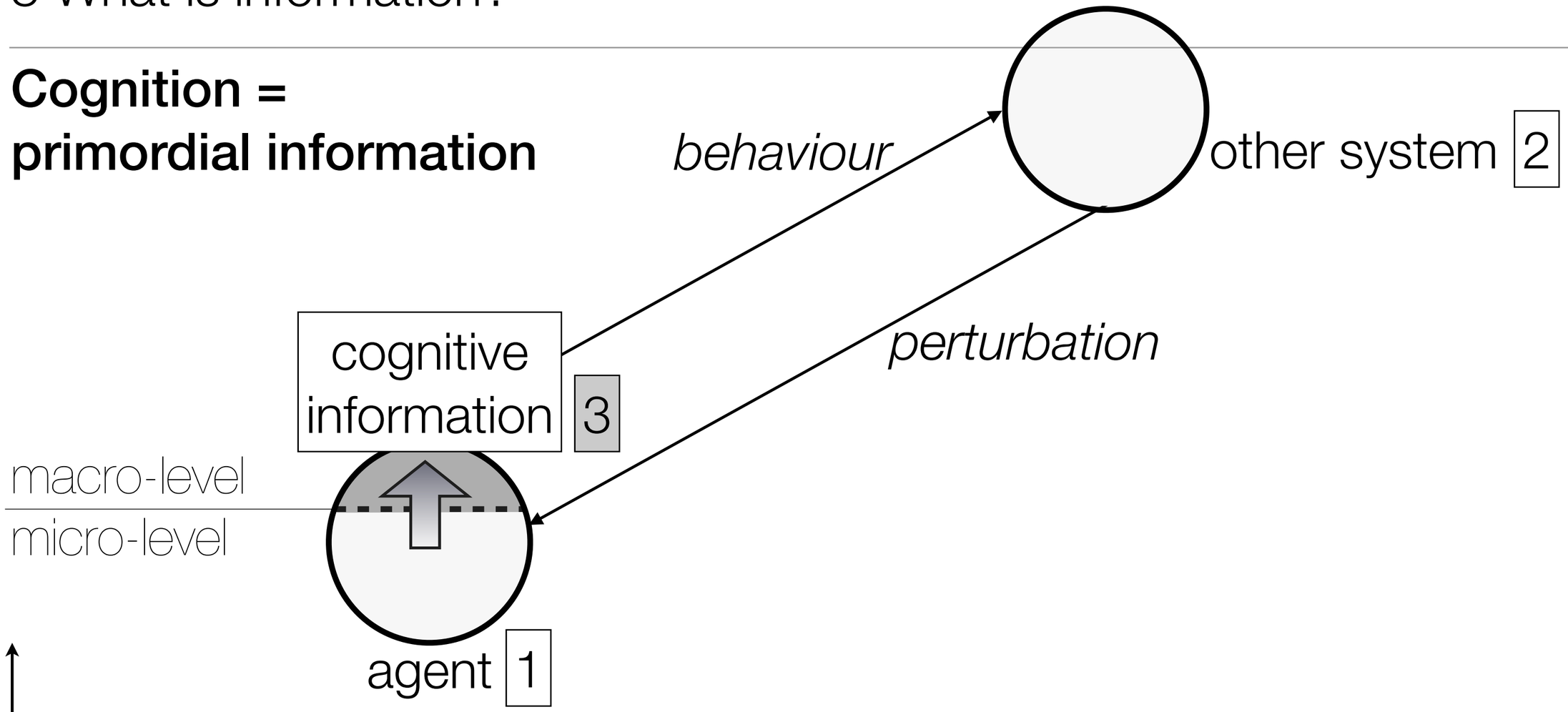
Varieties 1:
systemic information functions ("triple-c") – cognition, communication, co-operation



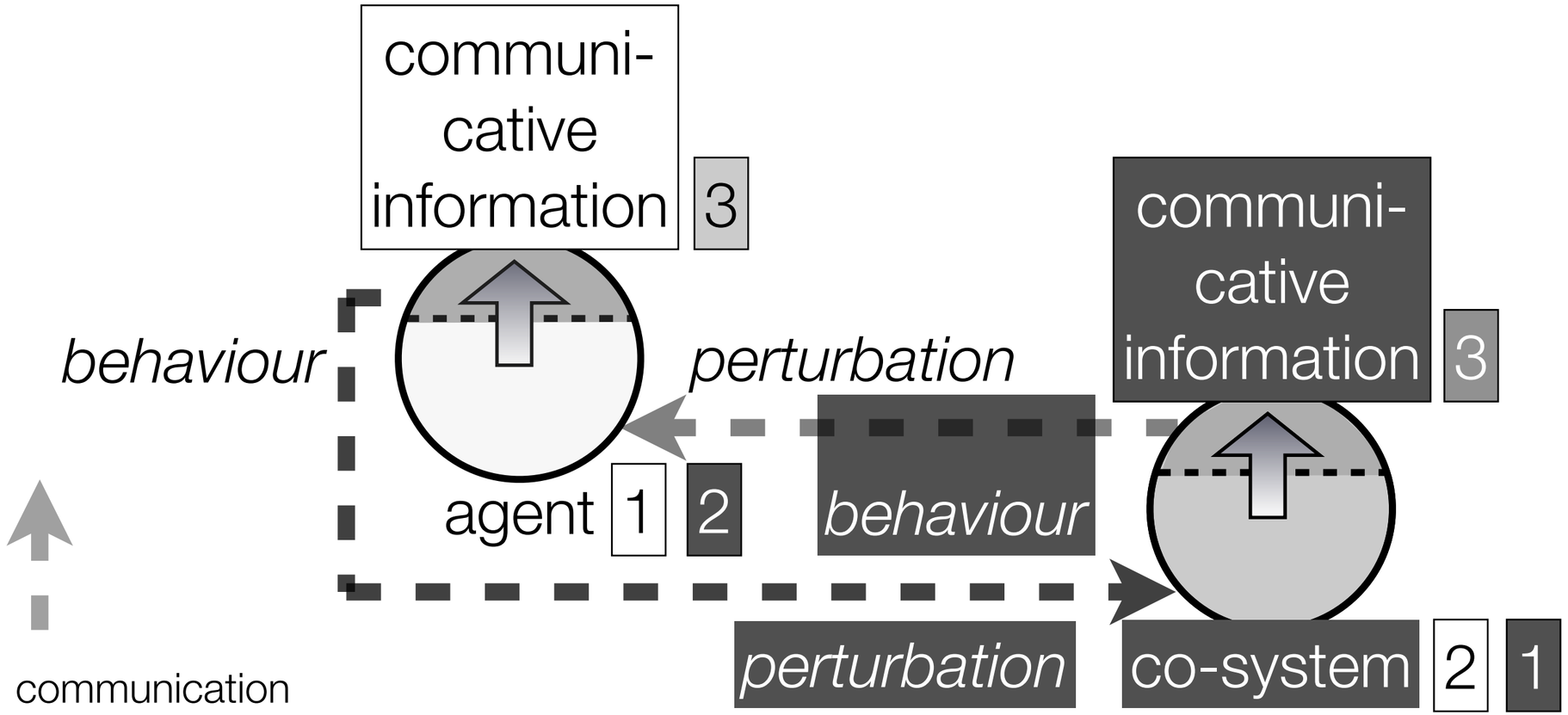
self-organised order = generated/utilised information

3 What is information?

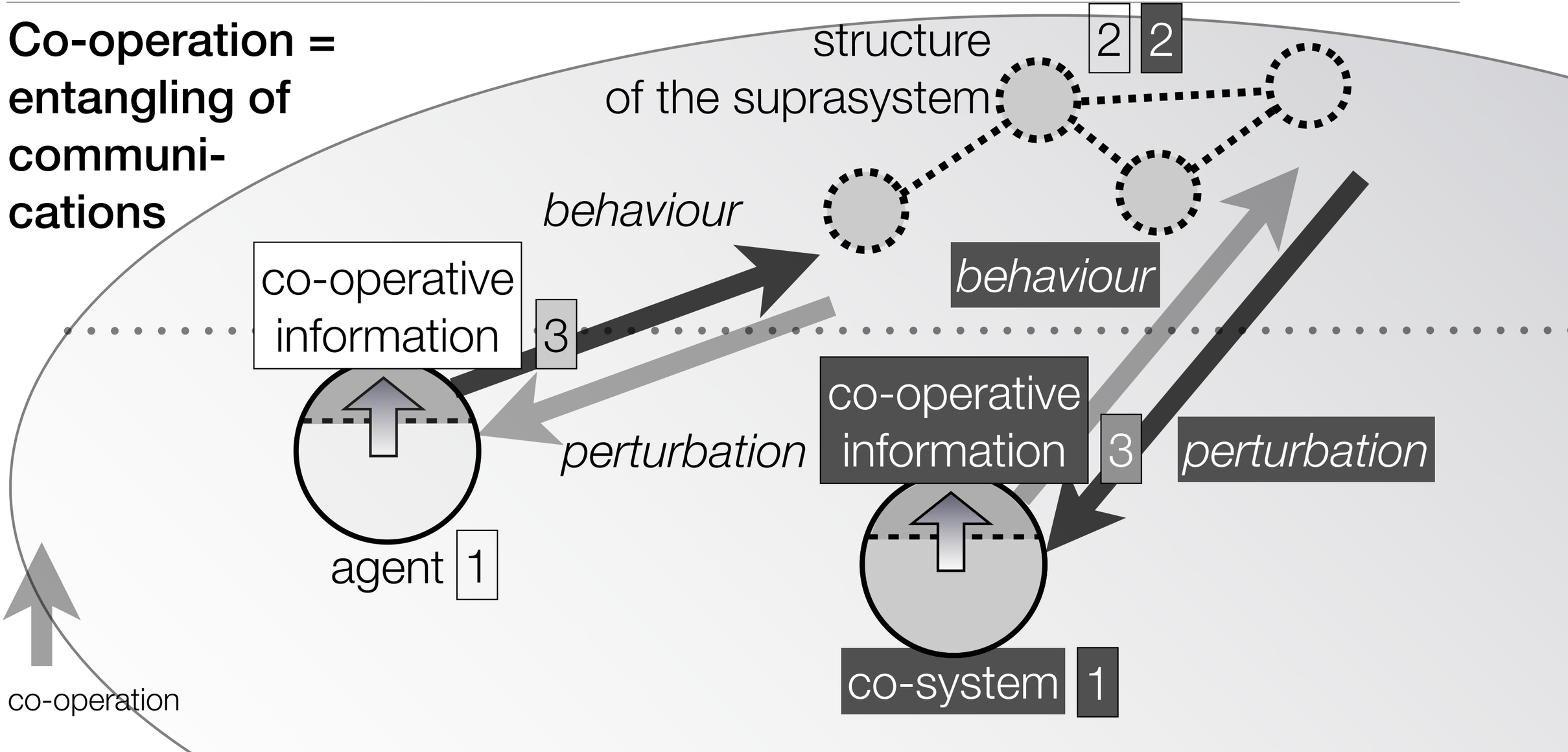
Cognition =
primordial information



Communication =
coupling of cognitions of co-systems



Co-operation = entangling of communi-cations



Varieties 2: evolutionary information types (stages) – pattern, code, sense

	self-organising systems			mechanical systems
	dissipative systems	autopoietic systems	re-creative systems	parts of technosocial systems
emergent information	pattern formation	code-making	constitution of sense	supporting constitution of sense

evolution,
increase in complexity