Building socio-emotional-cognitive platforms for interdisciplinary collaboration
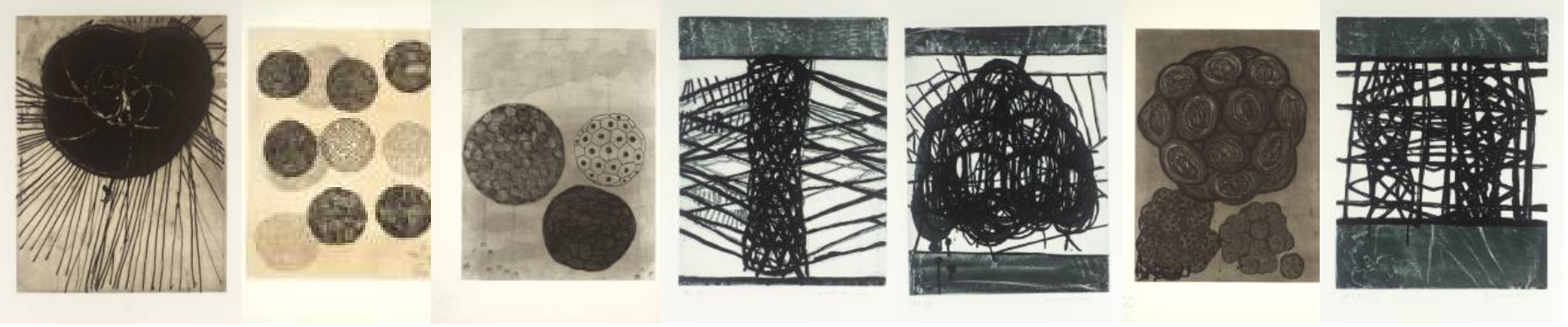
Veronica Boix Mansilla,
Michèle Lamont
Kyoko Sato

A roadmap

- Study overview

- SSEC Platforms for Interdisciplinary Collaboration

- Three markers of success

- Implications for research and practice

Research questions

How do researchers involved in long-term interdisciplinary collaborations create and sustain conditions for success?

(1) How do members of the group define markers of success? What facilitates success in their view?

(2) How do participants experience the construction of their group membership and collective work?

(3) What role do funders play to enable success?
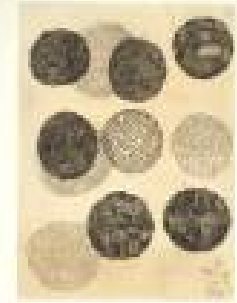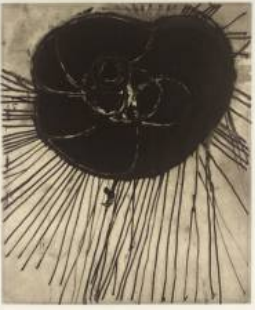
Methods –

Sample: Research networks

CIFAR	MacArthur	Santa Fe Institute
Successful Societies	Aging Society	Urban Growth and Social Dynamics
Genetic Networks	Early experience and brain development	Complexity of the Gene Concept
Social Interactions, Identity and Well-being	Adolescent Development and Juvenile Justice	Geochemical Origins of Life

Data collection

- <u>Internet searches</u>
- <u>Publications</u>
- <u>Observations</u> (5)
- <u>Questionnaires</u> (N=45)
- <u>Semi-structured interviews (N=55)</u>
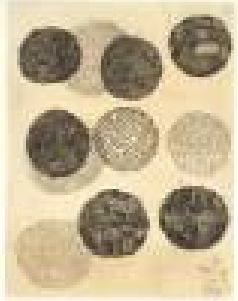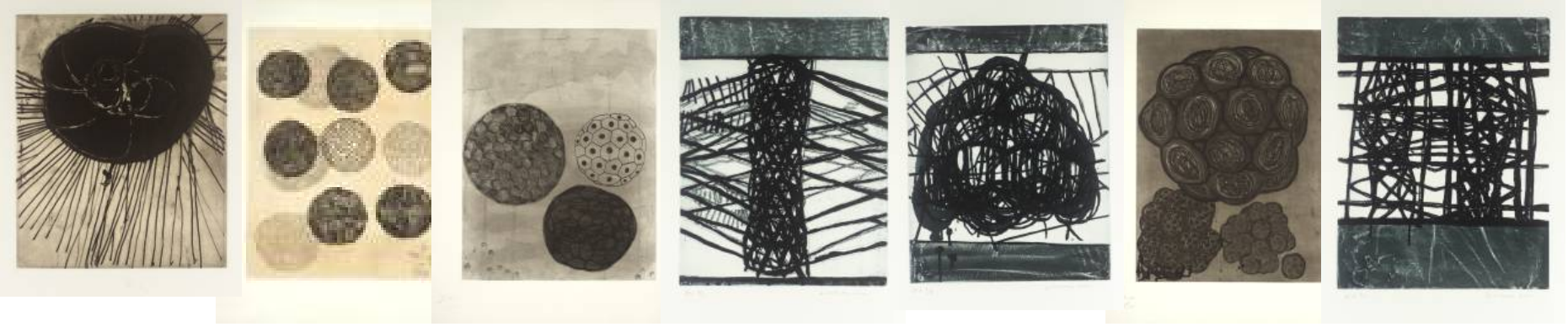
Shared socio-emotional-cognitive platforms for interdisciplinary collaboration

A SSEC platform is a collectively constructed space in which individuals interact **socially, emotionally,** *and* **cognitively** to study a relatively common question and advance productive insights through interdisciplinary exchange.

Shared Socio-Emotional-Cognitive platforms

SSEC model: markers of success- underlying conditions

Intellectual

Productive Problem Framing
Scholarly Caliber
Leveraging Integration
Critical Contribution

Interactional

Shared Group Identity
Member Moral Caliber
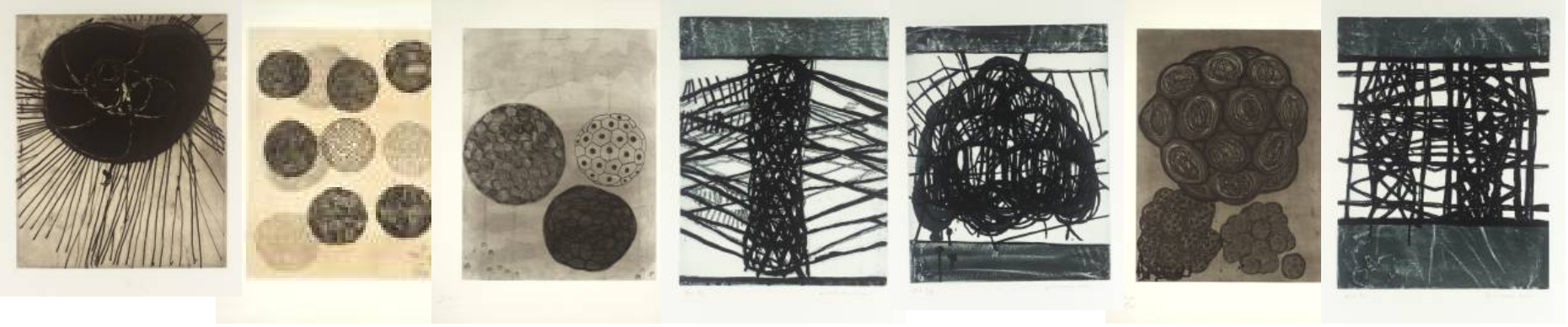Meaningful Relations
Shared Working Styles

Institutional

Mission Alignment
Strategic Resources
Loose Management style

underlying *Social- Emotional- Cognitive* conditions

SSEC platforms for interdisciplinary collaboration

A few conclusions upfront:

- *Emotions* play a constitutive role in the creation and sustenance of successful interdisciplinary collaborations.

- Collaborators manage intellectual, interactive and institutional demands *pragmatically* to create and sustain interdisciplinary collaborations.

- *Funding institutions* do more than set conditions for research; they significantly shape questions, interactions and engagement.

Table 2. Markers of Success.

	Dimensions[b]	Primarily Cognitive[a]					Primarily Emotional		Primarily Interactive	
Groups		Cross-disciplinary exchange C, (I)	Generativity beyond program C	Shared intellectual tools C, (I)	Excellent and relevant expertise C	Knowledge advancement C	Collective excitement E, C, I	Joy in collaboration E, I	Group deliberation and learning competency I, C	Meaningful relationships I, (C), (E)
A	$n = 11$	5	0	2	0	6	3	0	7	6
	%	46	0	18	0	55	27	0	64	55
B	$n = 9$	5	3	3	1	3	3	2	7	2
	%	56	33	33	11	33	33	22	78	22
C	$n = 7$	6	5	3	4	3	4	4	4	3
	%	86	71	43	57	43	57	57	57	43
D	$n = 6$	5	5	3	6	2	4	0	4	2
	%	83	83	50	100	33	67	0	67	33
E	$n = 5$	5	5	4	2	3	4	1	4	2
	%	100	100	80	40	60	80	20	80	40
F	$n = 7$	7	1	3	5	0	5	4	2	2
	%	100	14	43	71	0	71	57	29	29
G	$n = 7$	2	4	2	1	0	3	2	0	0
	%	29	57	29	14	0	43	29	0	0
H	$n = 5$	3	2	3	2	3	3	3	2	1
	%	60	40	60	40	60	60	60	40	20
Total	$N = 57$	38	25	23	21	20	29	16	30	18
	%	67	44	40	37	35	51	28	53	32

Note: Most relevant dimensions are listed first; secondary dimensions are listed in parentheses.
[a]Each marker is heuristically categorized for its most relevant dimension.
[b]Dimensions are cognitive (C), emotional (E), and interactive (I).

Table 3. Factors that Facilitate Success.

Groups	Dimensions[b]	Primarily Cognitive[a]						Primarily Emotional	Primarily Interactive							
		Relevant cognitive qualities C	Clear collective mission C, I	Productive problem framing C	Shared intellectual tools C, (I)	Iterative knowledge construction C, I	Search for interdisciplinary integration C	Positive feelings about project members and self (e.g., trust, respect, admiration, and recognition) E, I, (C)	Climate of conviviality I	Social-interactive qualities of participants I	Effective leadership I, (C)	Meaningful personal relations I, (C), (E)	Group Identity I, C, E	Complementary team roles I, C	Socializing outside meetings I	Group working styles and routines I, (C)
A	n = 11	5	1	3	1	2	4	4	2	3	2	1	1	1	2	2
	%	46	9	27	9	18	36	36	18	27	18	9	9	9	18	18
B	n = 9	5	2	2	3	0	0	6	6	4	5	2	2	2	3	1
	%	56	22	22	33	0	0	67	67	44	56	22	22	22	33	11
C	n = 7	4	5	4	3	3	3	3	2	4	3	4	2	3	3	3
	%	57	71	57	43	43	43	43	29	57	43	57	29	43	43	43
D	n = 6	5	6	6	4	5	5	6	5	5	6	1	3	3	2	5
	%	83	100	100	67	83	83	100	83	83	100	17	50	50	33	83
E	n = 5	5	4	3	4	3	3	5	4	4	4	4	3	0	3	2
	%	100	80	60	80	60	60	100	80	80	80	80	60	0	60	40
F	n = 7	7	6	4	4	5	1	6	7	7	6	6	2	6	2	0
	%	100	86	57	57	71	14	86	100	100	86	86	29	86	29	0
G	n = 7	4	6	6	2	2	2	1	2	1	2	1	0	0	0	0
	%	57	86	86	29	29	29	14	29	14	29	14	0	0	0	0
H	n = 5	2	3	3	3	3	3	2	2	1	0	1	0	0	0	1
	%	40	60	60	60	60	60	40	40	20	0	20	0	0	0	20
Total	N = 57	37	33	31	24	23	21	33	30	29	28	20	13	15	15	14
	%	65	58	54	42	40	37	58	53	51	49	35	23	26	26	25

Note: Most relevant dimensions are listed first; secondary dimensions are listed in parentheses.
[a]Each factor is heuristically categorized for its most relevant dimension.
[b]Dimensions are cognitive (C), emotional (E), and interactive (I).

Table 4. Three Dimensions in Markers of and Factors for Success.

Groups	Dimensions	Markers of Success			Factors of Success		
		Cognitive	Emotional	Interactional	Cognitive	Emotional	Interactional
A	n = 11	8	3	9	6	5	9
	%	73	27	82	55	45	82
B	n = 9	7	3	7	7	6	7
	%	78	33	78	78	67	78
C	n = 7	7	5	5	6	4	5
	%	100	71	71	86	57	71
D	n = 6	6	4	6	6	6	6
	%	100	67	100	100	100	100
E	n = 5	5	4	4	5	5	5
	%	100	80	80	100	100	100
F	n = 7	7	5	6	7	6	7
	%	100	71	86	100	86	100
G	n = 7	6	2	4	7	1	7
	%	86	29	57	100	14	100
H	n = 5	3	3	3	3	2	3
	%	60	60	60	60	40	60
Total	N = 57	49	29	44	47	35	49
	%	86	51	77	82	61	86

Note: This table presents the number and ratio of our respondents who invoked markers of and factors for success that encompass each of these dimensions. For instance, a respondent is counted if any of the markers of success she mentioned touched on an emotional dimension. To gauge the prevalence of each dimension conservatively, we have only counted a dimension when it is considered one of the "primary" dimensions, that is, those that are not in parentheses in Tables 2 and 3.

SSEC – Intellectual dimension

Substantive aspects of an interdisciplinary research network's work and the meanings subjects attach to these.

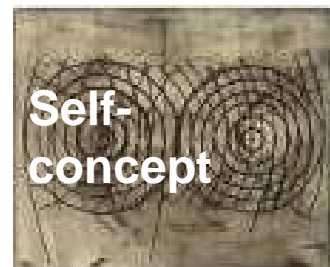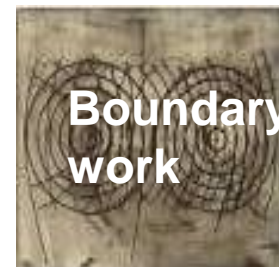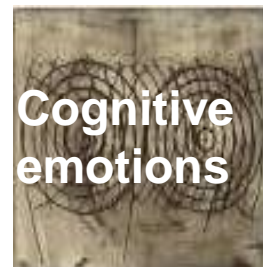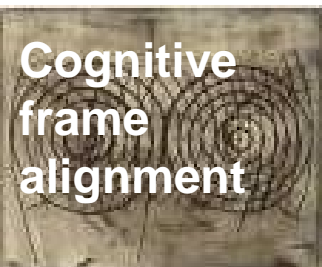**Markers of success:**

Productive Problem Framing

Disciplinary Caliber

Leveraging Integration

Critical Contribution

- Iterative definition
- Optimal ambiguity
- Intellectual engagement
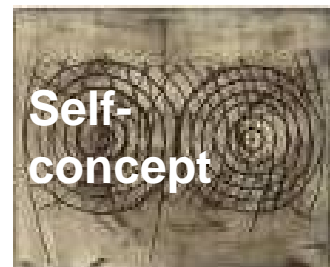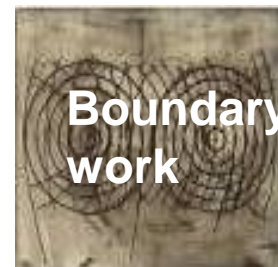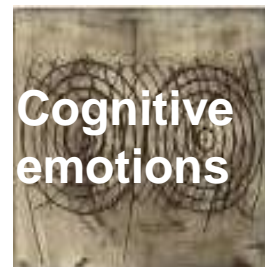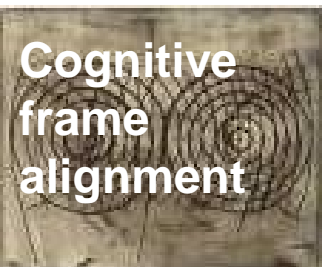
Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept

SSEC – Intellectual dimension

Substantive aspects of an interdisciplinary research network's work and the meanings subjects attach to these.

Markers of success:

Productive Problem Framing

Disciplinary Caliber

Leveraging Integration

Critical Contribution

Successful Societies:

How institutions and cultural repertoires affect health and capabilities

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept

SSEC – Intellectual Dimension

Productive Problem Framing: iterative process

In fact, early on people really wanted to focus on health because the health outcomes were quite unambiguous whereas in arguments about wellbeing and things like that you're never sure about what you've measured exactly. I was actually a bit disappointed about that early on because it actually worked to talk about what makes for a healthier society. Now that we've gotten our thinking aligned, we can kind of explore a range of capabilities without feeling the question floundering because people know how to make ideas build on each other.

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept
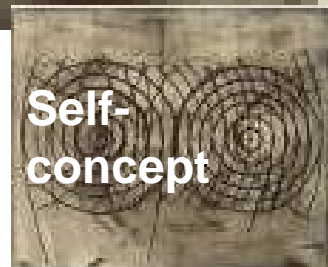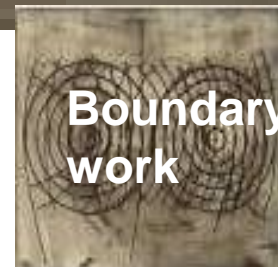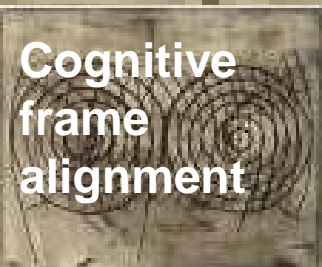
SSEC – Intellectual Dimension

Productive Problem Framing: optimal ambiguity

Well, it [the term "successful societies"] doesn't define exactly what it's all about. It only defines approximately what it's all about and that's good enough. One of the things that we learned early on at the population health program—the question was why are some populations healthier than others?—Well, people would come along and say you have to define health. And we said, no we don't, that would constipate the discussion. It's really good being somewhat ambiguous this way, and as ideas and contributions come forward that seem to click with each other in various ways we'll build the scaffolding as we go.

It's been very similar with this. I mean early on people were all fretting around, "Well, doesn't "successful societies" sound like a pretentious title? What do we really mean by it…" etc., etc. But any of those discussions where we try to ask those questions directly were actually quite sterile.

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept
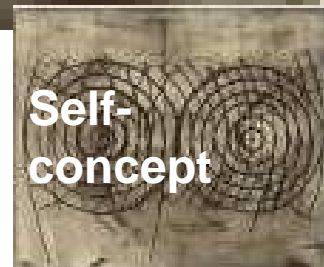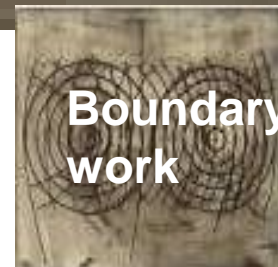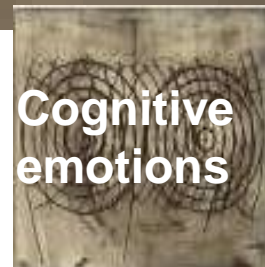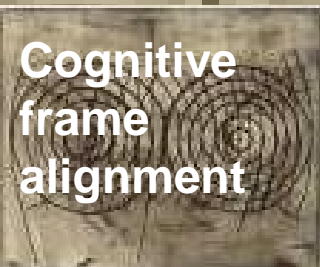
SSEC – Intellectual Dimension

Productive Problem Framing: Intellectual Engagement

I was extremely excited, actually. So it was a really phenomenal opportunity to take the kinds of issues that I actually worked on for 20 odd years and be able to move them to a level that you couldn't arrive at in any other way. [We were] thinking in an interdisciplinary group of very high level what societal issues are in an aging society, and drafting the agenda together of what questions to address and that answer to give.

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept
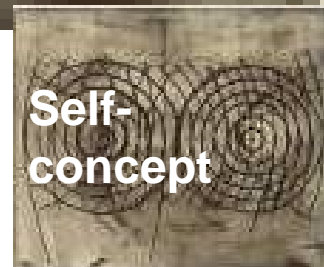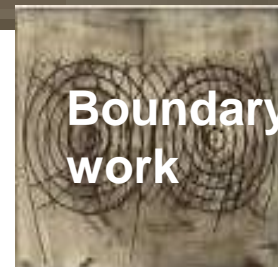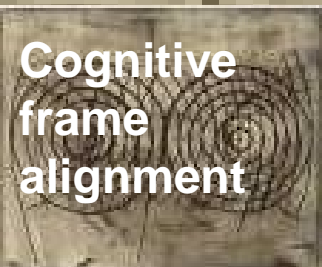
SSEC – Interactional Dimension

How individuals interact with peers and how interactions create a symbolic network that enhances or hinders interdisciplinary work.

Mission-based

Interactively calibrated

Inclusive of diverse members

Markers of success

Shared Group Identity

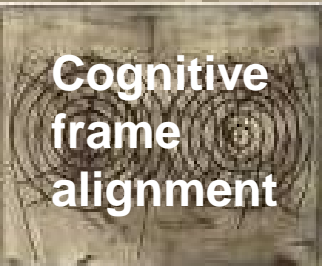Member Moral Caliber

Meaningful Relations

Shared Working Styles

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept
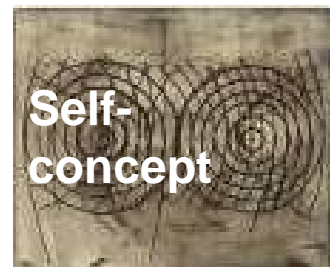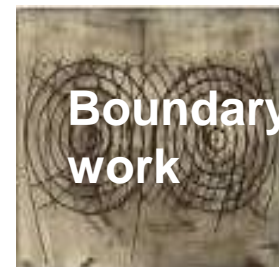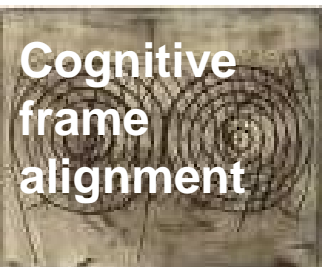
SSEC – Interactional Dimension

The thing that made it succeed in the end was the real commitment we made that we were going to try to do this and work on it together and really try to understand each other.

I often liken it to a marriage. That's a real commitment! You love them, you hate them, they drive you absolutely up the wall. They do things that piss you off, but they also do some of the most wonderful things you know.

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept

SSEC – Interactional Dimension

Shared group identity: Calibrating membership

> What we really are interested in is not just people who can bring a particular expertise, or even who have a kind of a style that's congenial to collaboration, but also who think in penetrating ways about things that are not their own area of expertise […] It's a matter of, how much are **they willing to put their mind into the collective enterprise.**
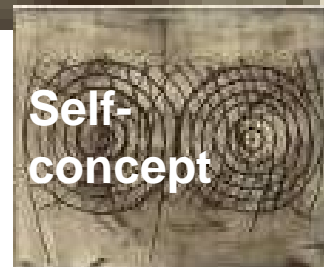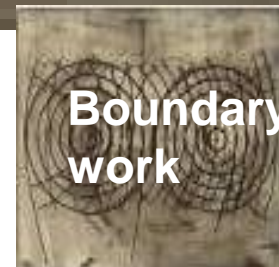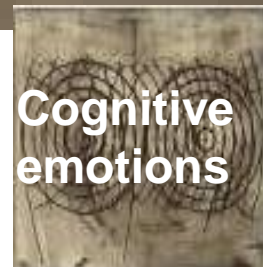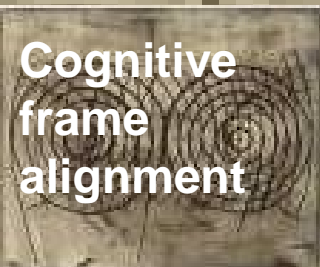
| Cognitive frame alignment | Collective effervesc. | Pragmatic stance | Cognitive emotions | Boundary work | Self-concept |
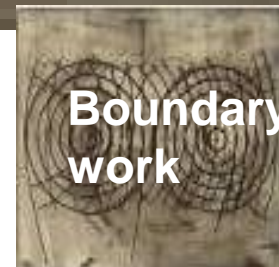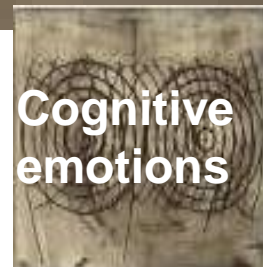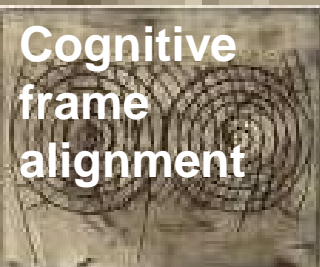
SSEC – Interactional Dimension

Shared group identity

Your ideas become the group's ideas.
It's sort of 'intellectual philanthropy.' You're giving it away and there's nothing in particular that you're going to get back in return except for being part of this special group.
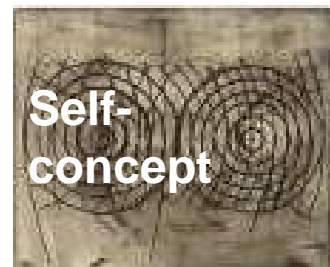
Cognitive frame alignment

Collective effervesc.

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Boundary work
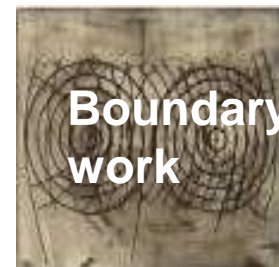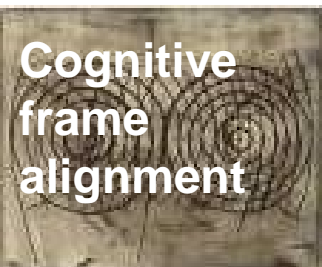
Self-concept

SSEC – Institutional Dimension

Funding organizations' conditions for intellectual work and interactions and the meanings subjects attach to these.

Markers of success:

Mission alignment

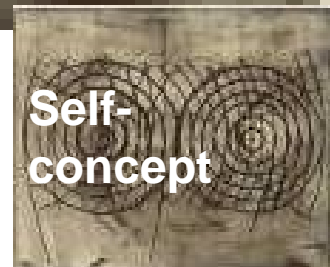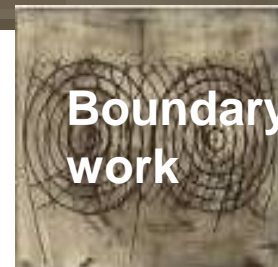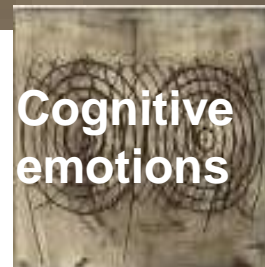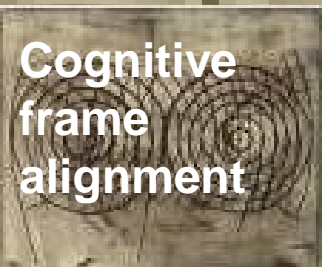Strategic resource allocation

Loose management style

| Cognitive frame alignment | Collective effervesc. | Pragmatic stance | Cognitive emotions | Boundary work | Self-concept |

SSEC – Institutional dimension

	CIFAR	MacArthur	SFI
Missions and **Expectations**	Big exploratory questions. **Knowledge for its own sake.** Fostering Canadian research.	Big questions, but more emphasis on **practical implication** (e.g., policy).	Search of **innovative concepts & methods** to solve new problems in complex systems.
Resources: sources, modes of funding	Public and private. **Funds members** for 5 years. Also covers meetings, outside research. Renewal possible.	Private. **Funds networks** for meetings and research. Multiple years and renewal possible.	Private and public. **Funds full-time faculty**, who initiate ID collaborations. Quick, flexible and small funding.
Management Styles	Closely involved in setting up networks. Then close, but hands off approach.	Closely involved in "test drive" phase (1-1.5 yrs). Hands off, some monitoring via network chairs.	**"Venture capital"**: Less managed. Immediate review of each event as an investment.

SSEC – Institutional Dimension

Mission alignment: flexible expectations (CIFAR)

I must confess at first I was surprised at the lack of more concrete requirements and felt quite vague about what we were supposed to be doing, though I really enjoyed all the discussions and was getting lots of new ideas, etc. Now, I think that not imposing a set of specific deliverables is very freeing and thus encouraging us to 'try something new and different' even if it might not work out right away. There is more space to take academic risks.

Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept

SSEC – Institutional Dimension

Mission alignment: Prestige (CIFAR)

It's part of what they do, they say: we only chose good people. And so then people take CIFAR seriously, so if it's a CIFAR program they are not immediately inclined to kiss it off and say it's la-la land from some people who are either gaga or never on the train in the first place. They say: I'd better pay attention to them, give them the benefit of the doubt because they're important.
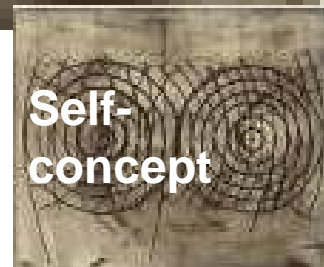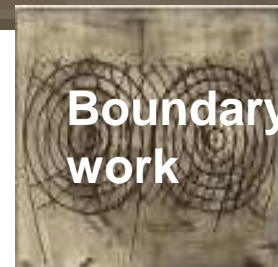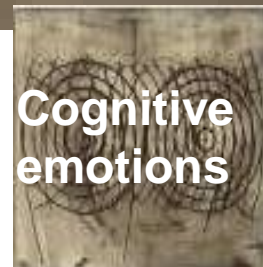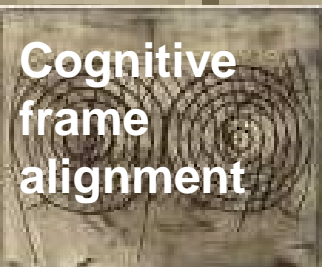
Cognitive frame alignment

Collective effervesc.

Pragmatic stance

Cognitive emotions

Boundary work

Self-concept

SSEC Platforms   ...IN SUM

Cognitive frame alignment

Self-concept

Collective effervesc.

Intellectual

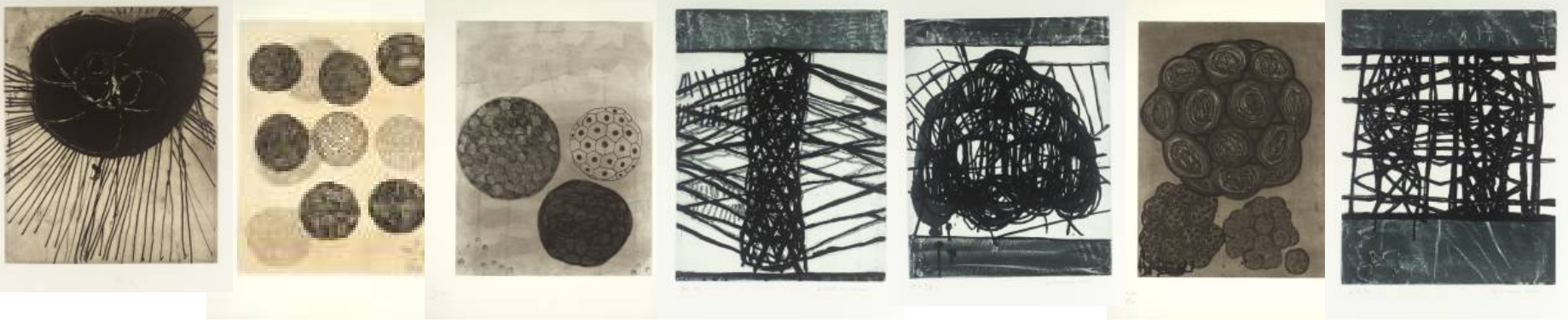**Interactional**

Institutional

Boundary work

Pragmatic stance

Cognitive emotions

SSEC platforms for interdisciplinary collaboration
QUESTIONS FOR FURTHER RESEARCH AND ANALYSIS

- How does the construction of SSEC platforms and notions of success differ among networks? (e.g., levels of coordination and consensus)

- Do different disciplinary combinations yield different kinds of SSEC platforms? (hot science- cool social science- hot policy)

- How do the demands of building SSEC platforms change over time?

- Are there prototypical kinds of SSEC platforms?
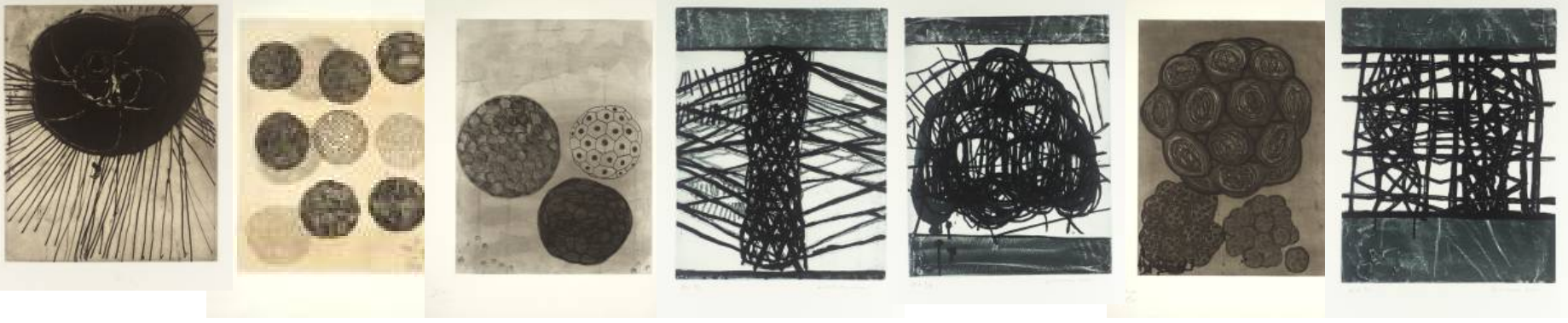
SSEC platforms for interdisciplinary collaboration
IMPLICATIONS FOR PRACTICE

- Intellectual, interactional and institutional dimensions matter in the success of ID collaborations

- Socio-emotional-cognitive dynamics underlie and organize participant's individual and collective experience

- Socio-emotional-cognitive dynamics may provide the foundation for an ***actionable framework*** to support interdisciplinary collaborations