



Networking / Dissemination Activity Scientific Report Form

Form (Word or PDF file) to be completed and uploaded via the online system within two months of the completion of the event for the following activities: working group meetings, seminars, workshops, symposia, conferences, summer schools, training programmes and specialised courses (graduate-level and continuing education), EUROCORES programme invited sessions at larger conferences, working group meetings (e.g. publication meetings).

a) **Summary**

EuroUnderstanding - EUROCORES Networking Activity 477

Within the EuroUnderstanding EUROCORES we hosted a network activity in form of a workshop with participants from the three nodes, DRUST, NormCon and CCCOM, hence the purpose was to create new connecting links and intensify existing network links. The cross collaborative workshop “Modelling the emergence of norms in Interactions“ had the ambition to join competences in the area of Norms and how they could be seen emerging in a rudimentary form (please see description of the scientific content below). The practical organisation of the workshop included presentations, hands-on demonstrations, and meetings. These activities were arranged around presentations and discussions on the evolution of norms and conventions, especially the first presentation contributed by Professor Robert van Rooij (PI in CCCOM) (in addition to a junior group member from his group Dr. Elliot Wagner). External guest speaker Professor David Sumpter from applied mathematics, Uppsala University, Sweden contributed with a ‘workshop within the workshop’ Thursday morning where participants were offered a chance to follow simulations and analysis of data by trial runs on their own computers.

Among the conclusions were that two aspects should be acknowledged with respect to arising norms namely that emergence is one thing but persistence and maintenance is another crucial part of the process, as unstable and volatile normative mechanisms would most likely not survive to be observed and hence less relevant. Another conclusion, which is already being applied in the planning of further activities, is that it may be useful to distinguish between norms and norm-based behaviour that function merely as protocols possibly with sanctions, but with no assumption of the existence of cognitive and emotional notions of normativity in the philosophical and/or religious sense. In line with these conclusions the next activity will be proposed being split in two parts accordingly.

It should provide a general picture of the meeting and describe the practical organisation / general arrangements. It should also summarise the scientific objectives and agenda of the meeting and the overall conclusion(s).

b) Final programme of the event

Modelling Emerging Norms workshop Preliminary program

Interacting Minds Centre

Wednesday March 6st	Thursday March 7th	Friday March 8th
	<p>9.00 <i>Hands-on Workshop</i> David Sumpter (overview) Andrea Perna Mario Romero Viktoria Spaiser</p> <p>Exploring Social Data</p> <p>(Incl. coffee)</p>	<p>9.00 Elliot Wagner Maintaining honesty in finite populations with divergent interests</p> <p>9.45 Christine Cuskey Shared cross-modal associations and the emergence of the lexicon</p>
13.00 Lunch	12.00 Lunch	12.00 Lunch/End of workshop
<p>14.30 Lars Bach Welcome and introduction.</p> <p>15.00 Robert van Rooij Vagueness, evolution, and bounded rationality</p>	<p>13.30 Pieter Wellens Adaptive strategies in the emergence of lexical systems</p> <p>14.15 Frank Esken Philosophical aspects of norms</p>	(Interacting Minds Lecture series: David Sumpter)
<p>16.00 Coffee</p> <p>16.15 Claudio Castellano An overview of opinion dynamics models</p>	<p>15.00 Coffee</p> <p>15.30 Vittorio Loreto On the emergence of linguistic conventions of increasing complexity</p> <p>16.15 Social and refreshments</p>	
19.00 Dinner	19.00 Dinner	

c) **Description of the scientific content of the event (abstracts can be provided)**

This workshop was a highly interdisciplinary activity spanning not only neighbouring disciplines, but disciplines only remotely related and sometime with radically different methodologies. As with all very cross-disciplinary efforts this is a somewhat risky endeavor (in terms of finding common ground that call for elaboration with resulting mutual benefit), but potentially very fruitful and as expected we spend especially in the first half of the workshop time on identifying common ground in both terms and methodology. Here below is a collection of abstracts for selected presentations.

ROBERT VAN ROOIJ

Title: TBA Title: Vagueness, evolution, and bounded rationality

Vagueness is a pervasive feature of natural languages that is challenging semantic theories and theories of language evolution alike. We focus here on the latter, addressing the challenge of how to account for the emergence of vague meanings in signaling game models of language evolution. We suggest that vagueness is a natural property of meaning that evolves when boundedly rational agents repeatedly engage in cooperative signaling.

PIETER WELLENS

Title: Adaptive strategies in the emergence of lexical systems

In this talk I will give some background on the computational modelling of emergent (linguistic) conventions. More specifically on the approach taken in the so-called language game paradigm. I will show how this research track has, over the past two decades, tackled increasingly more difficult problems of conventionalisation. I will then go into more detail about two different approaches to the learning and the emergence of (lexical) meaning. One approach follows a view in which uncertainty is represented by maintaining competing conventions and systems to dampen such competition, the other approach proposes a more adaptive approach to uncertainty in which representation can be used flexibly and is shaped by use.

CLAUDIO CASTELLANO

Title: An overview of opinion dynamics models.

I will present some extremely simple models of opinion dynamics aimed at describing how shared conventions emerge from an initial state in which different alternatives coexist.

They are essentially null models that allow us to understand in full detail the consequences of specific interaction mechanisms, thus allowing to have control on the role of such mechanisms in more sophisticated models.

Emphasis will be on qualitative aspects such as robustness, size effects, and the role of the topology of the interaction pattern.

DAVID SUMPTER

ANDREA PERNA

MARIO ROMERO

WORKSHOP DATA SESSION AND COLLECTIVE RULE-BASED BEHAVIOURAL MODELLING

Title: Exploring social data

Animals moving in group, such as flocking birds and schooling fish have to repeatedly face the task of remaining together with their neighbours, in spite of the fact that different individuals often have different preferences about what to do and where to go. In these groups, communication is mediated through movement interactions: a bird turns to the right because its neighbour has turned to the right.

In the proposed hands-on activity we will explore in simulation what happens when two animals moving together follow different "rules" in responding to the movement of their neighbour. Some combinations of rules lead to the splitting of the group, while other combinations can lead to compromise between the preferences of the two individuals or to one individual determining the final direction of movement of the pair.

FRANK ESKEN

Title: Ontogenetic early forms of rule-following

How can early forms of rule-following be distinguished from mere dispositional behavior like infants circular reactions (Piaget)? What is constitutive for rule-following?

To distinguish:

- a response that conforms to a given standard
("You should not do A")
- a response that is actually guided by a given rule
("If there is A, then I should do B")

Both responses include norms, but of a very different kind. The distinction between conformity to norms and rule following will be spelled out in some detail.

VITTORIO LORETO

Title: On the emergence of linguistic conventions of increasing complexity

In this talk I'll review some of the progresses made in the last few years concerning the general problem of how a population of individuals can bootstrap and share linguistic conventions. I'll discuss in particular several examples corresponding to the early stages of the emergence of a language, namely the emergence of a common lexicon, the emergence of a shared set of linguistic categories or the emergence of duality of patterning. In all these cases I'll try to address questions related to the role of the population size, the underlying social network and the link between cultural and evolutionary time-scales.

ELLIOT WAGNER

Title: Maintaining honesty in finite populations with divergent interests

When speakers' and hearers' interests are sufficiently misaligned, communication may not be possible at Nash equilibria. After all, why would the receiver listen to signals if the sender has a temptation to deceive? And why would the speaker signal informatively if she can gain through exploiting the receiver's behavior? Roughly speaking, this wisdom is confirmed through standard infinite population models of learning and evolution in games. Infinite population models do not have limit points that are not Nash equilibria, and therefore these models do not predict the

emergence of communication in signaling games with sufficiently misaligned interests. Models of finite populations, however, sometimes exhibit different long-run behavior; due to random chance (which is washed out in infinite population models), non-equilibrium strategies can occasionally become fixed in finite populations. Using techniques developed by Fudenberg and Imhoff (2006), it is demonstrated in this paper that finite populations may have a high probability of sustaining communication even when interests are so divergent that separating strategies are not Nash equilibria of the underlying signaling game. The persuasion game (Milgrom and Roberts, 1986) is used as an example of this phenomenon.

CHRISTINE CUSKLEY

Title: Shared cross-modal associations and the emergence of the lexicon

This talk will focus on how linguistic conventions are grounded at their emergence. Specifically, I will focus on a theory which holds that shared psychological biases to make mappings between modalities (i.e., *cross-modal associations*) scaffolded a shared lexicon in the emergence of language. Cross-modal associations are well documented across a variety of sensory domains, but this talk will focus on associations involving linguistic sound. First, I will present evidence that associations between linguistic sound and shape, taste, and motion are robust. Second, I will demonstrate that in some cases associations are actually borne out in language, showing cross-linguistic patterns in modern language, which mirror documented associations. Finally, I will present a theoretical model of how and why a cross-modally grounded proto-lexicon would have grown into the larger, characteristically arbitrary systems we observe in modern language.

It should provide a detailed picture of what went on during the meeting: brief summaries of presentations, synopsis of subsequent discussions (agreements/disagreements/highlights).

d) **Assessment of the results and impact of the event on the EUROCORES programme.**

Added value and relevance to the EuroUnderstanding CRPs.

The combination of CCCOM, NormCon and DRUSR participants offered a very broad range of researchers dealing with norm system. We have now established personal connections that allows researchers to mutually check their results. Especially in the case of simulations presented at the workshop with similar structure and parameters (or could be made similar if not identical with respect to the normative mechanisms. We believe that collaborations between **DRUST**, **NormCon** and **CCCOM** have been established or reinforced, which can be seen from the fact that new network activities are already being planned. As mentioned the conclusion that it may be useful to distinguish between two representations of norms (and norm-based behavior). 1) One that starts by looking at norms as behavioural protocols (possibly with mechanistic sanctions), but with no notion of normativity. 2) Another viewpoint recognizing the existence of cognitive, emotional and moral notions of normativity in the philosophical and/or religious sense. As a result the next activities are propositioned two parts each with a focus of the two views above. In addition, it should be recognized that emergence or norms is one thing and persistence and maintenance is another crucial part of the process. Again it should be view as a valuable characteristic of this activity that the colleagues sharing knowledge in this

workshop represented a very broad range of disciplines ranging from mathematics, physics and biology to philosophy, cultural cognitive science and political science. A challenge and opportunity that we believe was successfully exploited with the consequence of strengthening the interdisciplinary ties within the EUROCORES program.

It should describe what was gained from the meeting. Concrete or follow-up actions to be taken as a result (i.e. dissemination plan) should appear in this section.

e) List of speakers and participants

Participants:

Elliot Aguilar, Stockholm University
Daniel Cownden, Stockholm University
Esteban Fredin, Aarhus University
Riccardo Fuseroli, Aarhus University
Glenda Hannibal, Aarhus University
Fredrik Jansson, Stockholm University
Stefan Larsen, Aarhus University
Gema Martin-Ordas, Aarhus University
Lotte Meinert, Aarhus University
Gregory Mills, University of Edinburgh
Marco Nørskov, Aarhus University
Glenda Satne, Aarhus University
Johanne Seibt, Aarhus University
Jesper Sørensen, Aarhus University

Speakers:

Robert van Rooij, Amsterdam University
Cladio Castellano, Rome University
David Sumpter, Uppsala University
Andrea Perna, Uppsala University
Viktoria Spaiser, Swedish national institute of future studies
Pieter Wellens, Free University of Brussels
Frank Esken, University of Salzburg
Vittorio Loreto, Rome University
Elliot Wagner, Amsterdam University
Cristine Cuskley, Rome University

Co-organisers:

Carsten Olsen, Aarhus University
Lars Bach, Aarhus University

Organiser:

Andreas Roepstorff, Aarhus University