Poster Abstracts

Abigail Connor.
Measuring Phenomenal Duration

Survivors of life threatening accidents have reported an experience of phenomenal time as slowed down. Such reports conflict with the naïve realist account of perception, which claims that physical events determine the phenomenal character of our experience. Phillips presents a relative account of phenomenal duration with the aim of defending naïve realism against the reports of slow time. Phillips' defence relies on the claim that the phenomenon of slow time is accounted for through a relative increase in non-perceptual mental activity. I argue that we must reject Phillips' relative account, as it is inconsistent with reports of slow time in meditation.

Alessandra Buccella.
Naturalizing qualia

Experiences are the filter through which the external world "reveals itself" to us. To naturalize experience means to explain the fact that we are consciously "in touch" with the world in a way that is maximally coherent with the results of the scientific study of perceptual systems. On the other hand, philosophers who are skeptical about the so-called "naturalizing project" sometimes dismiss it by saying that it is hard for a purely naturalistic view of perceptual experience to find room for what Kim (2006) defines as "the ways that things look, seem, and appear to conscious observers", or qualia. An example of a perceptual quale is the smallness that I experience while observing both a truck on the street very far away from me and a toy truck in my hand. The real truck from a distance looks small to me. The miniature toy truck looks small as well. Although the objective sizes of the real truck and of the toy truck are very different, when the real truck is far away and the toy truck is in my hand they both look small to me in the same way. Hill (2014) puts forward an account of qualia that explains them in the context of a naturalistic representationalist theory of experience. In this paper, I will disagree with Hill's claim that his view provides the only good naturalistic account of qualia. In particular, I think a certain version of adverbialism could potentially explain qualia. Adverbialism avoids one problematic commitment Hill's view has, thus being a genuine and preferable alternative, even assuming Hill's view is not itself flawed in any respect.

Alfredo Vernazzani.
Do we Perceive Facts?

In his 'Perception, Hallucination and Illusion' William Fish maintains that we see facts, understood as actual states of affairs. Let us call this thesis 'factualism'. Factualism would be supported by experimental and theoretical considerations on object perception. Such considerations center on the nature of sensory individuals in the debate on the feature-object Binding Problem. According to Matthen, Cohen, and Pylyshyn sensory individuals are better understood as objects. The central claim is that visual tracking mechanisms track objects understood as particulars, and that properties enter visual perception only at a later stage. Hence, Fish's conclusion that we see facts. In this study, I argue against Fish's conclusion. I will first

clarify the notions of facts and states of seeing. Then I will reconstruct the debate on sensory individuals, preparing the stage for an assessment of factualism. I will then show that a factualist interpretation of the experimental evidence leads to odd consequences. Finally, I will provide an alternative reading of the experimental evidence. It is my contention that visual tracking mechanisms track properties rather than 'substances'. This reading undermines factualism and offers us some hints towards an ontology of visual objects.

Amélie Gourdon-Kanhukamwe.

Directionality of probability phrases is not determined by their linguistic head.

Verbal probabilities (e.g., it is likely) are suggested to be preferred to numerical probabilities by speakers who express uncertainty (Erev & Cohen, 1990). These phrases are made of a modal adjective (e.g., it is possible) or noun (e.g., there is a possibility), sometimes a verb (e.g., it may be), with, in cases, the addition of a modifier (e.g., there is a little possibility). In addition to conveying a quantity of uncertainty, verbal probabilities carry a directionality (Teigen, 1988), that focuses the receiver on the occurrence (positive directionality) or non-occurrence (negative directionality) of the outcome. As quantifiers, these modifiers carry their own directionality (e.g., a few and few; Sanford, Fay, Stewart & Moxey, 2002), which could be different to the modal itself (e.g., there is little certainty). Linguistic theory suggests that the head of a phrase determines its syntactic function and the semantic category (see e.g., Corbett, Fraser & McGlashan, 1993). In this perspective, in verbal probabilities, the modal is the head, and its directionality may prime, so that little certainty should have a positive directionality. However, directionality may have multiplicative properties: when a negative directionality introduced an uncertain event with a negative valence (e.g., it is unlikely that this car will break down in the next two years), participants showed similar probability judgements and behavioural intentions to when a positive directionality introduced an event with a positive valence (e.g., it is very certain that this car will run well for many years; Gourdon & Villejoubert, 2009). Therefore the directionality of the head (the modal phrase) could be cancelled by the directionality of the modifier, so that little doubt would focus a receiver on the occurrence of the uncertain event. In this study, we used the completion paradigm (Teigen & Brun, 1999) to test this competing predictions. Participants read 34 sentences presenting positive and negative modifiers (e.g., little vs a little) with positive and negative modals (e.g., doubt vs possibility), and completed these with reasons for explaining the sentence. For each sentence, they also provided a plausibility judgement and a probability judgement. Results indicated that directionality of the modal interacts with directionality of the modifier: a negative modifier associated to a negative modal were more often completed with a reason in favour of the uncertain event, similarly to when the directionality of both the modal and its quantifier is positive. In the contrary, a combination of negative and positive directionality led to more frequent completion with reasons against the uncertain event, when the negative directionality was carried by the modifier. These results provided empirical data to refine material construction in experiments on verbal probabilities, but also new insights about the linguistic perspective on heads. While the head determines the syntactic function and the semantic category of a phrase, it is suggested that it does not determine its pragmatic function and that probability phrases may be considered headless.

Andrea Schiavio, **Ashley Walton**, **Matthew Rodger and Johanna Devaney**.
Participatory music-making as participatory sense-making. An empirical study.

Is it possible to study joint music-making as a self-sustaining system defined by the performers' breakdowns and recoveries of coordinated behavior? Traditionally, participatory musical behavior has been explored through what appears to be an individualist perspective, which considers the single agent - defined as 'mindreader', or 'simulator' of the others' mental or behavioral states - as the main explanatory unit of the interaction. This view, however, may downplay the role of real-time musical interactions, and reduce joint action to a stimulus-response schema.

Our aim, then, is to go beyond such spectatorial stance, investigating how musicians maintain structural unity through a mutually influencing network of dynamical processes. For example, is visual information needed in order to achieve coordination among musicians? What kind of gestural coupling is necessary to keep playing together when the auditory signal is perturbed externally?

In order to answer such questions, we will recruit six pairs of string players divided into two groups (by level of expertise) of three pairs each. The participants, wearing noise-cancelling headphones, will be initially asked to play two pieces individually (taken from Bartok's 44 Duos for 2 Violins). After this, they will perform together in three main conditions, designed to test how disturbance in the audio signal may shape coordinated behavior when partners are differently 'present' to each other. These conditions involve participants being (A) naturally placed one in front of the other, (B) divided by a partition seeing only each other's shadows, and (C) unable to see each other (but connected through an experimentally manipulated audio-video-interface). For all conditions two different playing modalities (randomised) will be investigated: (i) without disturbance (ii) with brief, unpredictable audio disturbances (white noise) for both performers.

To investigate their interactive behavior, audio and motion-capture data will be extracted, measured, and compared within and between groups during individual and joint performance. Features to be examined include zero-crossing rate, amplitude and duration variables for each movement, and onset synchronicity in the audio signal. Although results will only be available for the conference, we predict significant differences in interacting behavior related to musical expertise, condition, and manipulation.

In terms of our long term goals, we are confident that modeling how the loss and regain of coordinated behavior impact musical performance will help us better comprehend how musicians develop new contextual significance through interactions - how they negotiate emotional, expressive, sensorimotor, and communicative musical skills in real time.

Andreas Domberg, **Bahar Koymen** and **Michael Tomasello**.
Argument Selectivity in Children's Peer Discussions

Reasoning is central to human decision-making and problem-solving. Traditionally, it has been seen as an individual skill aimed at enhancing individuals' knowledge. As such, it has been shown to succumb e.g. to the Confirmation Bias, which leads speakers to discard evidence that would contradict previous beliefs (Kunda, 1990; Nickerson, 1998).

In a recent re-characterization of reasoning, Mercier and Sperber (2011) portray it as a social-communicative skill, whose role is the effective production and critical evaluation of arguments in discourse, thus explaining Confirmation Bias. It is motivated by the notion of Epistemic Vigilance (Sperber et al., 2010), which serves to guard hearers from uncritically accepting any claims made in discourse. Speakers, in turn, are motivated to come up with arguments anchored in accessible evidence and logic to overcome this mistrust. Tomasello (2014), however, underlines the role that argumentation plays in cooperative situations, in which joint deliberation has the purpose of finding the best solution to a problem. Here, the function of an argument is not simply to sway interlocutors, but to defend the best course of action. Consequently, who introduces the winning argument is less important to speakers.

In the present two studies, we asked pairs of 5- and 7-year-old peers to build a zoo together, jointly deciding where to put a series of toy animals, and providing arguments. Each child owned one half of the zoo, and the reward scheme either encouraged finding good solutions cooperatively or competing over the animals. In Study 1, we extracted the arguments that children produced and coded for each whether it favored placing the animal on the speaker's vs. their peer's side, and whether it was an affirmation (explaining why an animal should go to a location) or a refutation (explaining why an animal should not go there). The results showed that when they competed, both 5- and 7-year-olds produced fewer arguments, and a bias for their own side. While 5-year-olds relied on affirmations in producing this difference, 7-year-olds relied both on affirmations and refutations.

To establish whether children in the competitive condition simply restricted their attention to their own side, or whether they strategically withheld arguments for their peer's, in Study 2 we ensured they knew a set of arguments. Each child owned a different cage with three unusual objects (e.g., an alarm clock). One child, the trained child (T), learned three critical arguments that worked for the objects in one cage (e.g., "The bear goes to the alarm clock, because bears hibernate and need to wake up in spring."). Later, when playing with a naïve peer (N), these arguments would associate the animals with objects in N's cage. We analyzed whether T reproduced critical arguments in cooperative vs. competitive contexts. The results suggest that 7-year-olds reproduced the critical arguments significantly more in the cooperative than in the competitive condition, whereas 5-year-olds did not distinguish between conditions.

Overall our findings suggest that cooperative contexts elicit more, and also more objective argumentation, and that 7-year-olds adapt more strongly to the associated communicative goals.

Anna Welpinghus.

The role of imagination for implicit bias **Ansgar Endress**. *Rational vs. primitive learning*

Implicit prejudice, also called implicit bias, is widespread: people judge CVs of equally qualified candidates of different genders or races differently (e.g. Jost et al. . Some white people in the U.S. send friendlier non-verbal signals to while conversation partner than to black conversation partners in an experimental setting (Dovidio et al 2002). Since this behavior can occur while in conflict with explicitly endorsed beliefs, it must be governed by processes different from explicit reasoning. In this sense, the bias is implicit. The philosophical debate has centered on the nature

of the implicit mental attitudes that elicit biased behavior and implication for rational agency and responsibility (e.g. Brownstein sep, Brownstein & Saul 2016a, 2016b). The role of imagination for implicit bias has hardly been explored. This paper identifies two roles of imagination for behavior that exemplifies implicit bias towards members of social groups. This novel account allows to show how implicit bias operates independently from explicit beliefs (and in what sense it does not). It also sheds light on the question in which sense implicitly prejudiced behavior is biased, i.e. from what standard we deviate when we are implicitly biased.

Implicit bias can be created by employing deliberate imagination (Gregg, Seibt & Banaji 2006), and it can be reduced after people have been exposed to counter-stereotypical pictures (Dasgupta & Greenwald 2001; Peck et al. 2013, Maister et al. 2013). In line with these and other empirical findings on implicit biases, I describe two important ways imagination lead to biased behavior (these alternatives are not exhaustive).

1. Deliberate decision making: when we have to decide something, we use imagination in order to assess the outcomes of our decisions ("how would this job candidate solve a challenge or interact with her colleagues?"). Imagination is a powerful tool in decision-making because it enables us to integrate the information present in the CV with a richer body of social information. But therefore it is to be expected that stereotypes shape what we imagine. Because the process of constructive imagination (cf. van Leeuwen 2016) is not one of inferential reasoning, stereotypes can enter the imagination when we do not intend this.

Characterizing imagination will allow to show why implicit bias operates to some degree independently from explicitly endorsed beliefs: the same characteristics that make imagination a valuable tool for decision-making also invite stereotypical information to enter the decision-making procedure – regardless of whether we think it should enter.

The nature of the bias is as follows: since the task is to identify the best candidate based in the information in the CV, gender or race should not play a role in the decision – even if most women or people of color would be less qualified for the job in question, evaluating a CV that describes the same level of qualification differently constitutes a bias. Group categories do not occur in justification people give of the evaluation. The bias here is a departure from a norm of theoretical rationality, namely to base a judgment only on relevant facts.

2. Spontaneous behavior: If spontaneous behavior such as giving a friendly answer is modulated by an interlocutor's group membership, it might be because the way we interpret an interaction is modulated by imagination (simulating what is going on in the other person's mind is only part of this). The fact that techniques of using imagination for creating or reducing implicit bias correlate with outcomes in the IAT (a test which measures how quickly we learn to associate categories), is evidence for this hypothesis. In contrast to the first case, imagination is not deliberately initiated, far less elaborate in its content and it might be unconscious or unattended to. In contrast to the first case, imaginings here have direct action-guiding effects, as I will argue by drawing on recent work on imagination (Funkhouser & Spaulding 2009; van Leeuwen 2016).

Again, the process operates to some degree independently from explicit beliefs. The characteristics of imagination that make action-guiding imagination helpful for competently navigating social interactions also make it likely that stereotypes shape what we imagine. That is why they are so persistent. The nature of the bias, however, is not a failure to meet any norm of theoretical rationality. Rather, the biased person departs (albeit minimally) from a norm of social justice, that group membership should not matter for the way one behaves in the context in question.

If these two quite different processes lead to biased behavior, questions regarding rationality, control, and responsibility will require more or less different answers for different sorts of implicit bias.

Cathal O'Madagain and **Daniel Haun**.

"10 million people can't be wrong": what do the Folk really think of Majorities?

As the song suggests, we sometimes think that the opinions of groups come with wisdom. And as the Condorcet Jury Theorem shows, this can be true: under the right circumstances, the majority answer to a question will be almost certainly right (List and Pettit 2011: 87). This requires that individual answers are independent, and individuals are on average more likely to give the right answer than the wrong one. However, if these conditions are not met, for example if individuals in the group are on average more likely to give the wrong answer, then the majority will be almost certainly wrong – even in a crowd of ten million (Sunstein, 2006: 28).

How sensitive are we, then, to the circumstances under which groups can be sources of wisdom? Do we regard them as sources of 'unconditional wisdom', as the song suggests, or as sources of 'conditional wisdom', knowing when to defer and when not to? The question has important implications for social learning: if we intuitively defer to majorities under the right circumstances, such deference may improve our beliefs; but if we defer unconditionally, such deference may have a negative effect on our beliefs. Here we designed a survey to answer this question.

We present participants with twelve multiple-choice questions, under three levels of difficulty, for example:

Very Easy: "how many legs does a fly have: 1, 6, or 15?"
Medium: "in what country are the Victoria Falls found: Venezuela, Brazil, or Columbia?"
Very Difficult: "what weight was the largest Cat Fish ever recorded: 143.5lb, 144.5lb, or 145.5lb?"

Participants are told that they must answer these questions, but first can choose for four of the questions to use an 'Ask the Audience' card. If they use this card, they are told, they will be shown the majority answer given to the question in an independent survey, to help them. They are also asked to rate the difficulty of the questions.

We take an 'unconditional wisdom' hypothesis to be supported by participants using their 'ask the audience' cards for the questions they rated as most difficult, which in fact the audience are unlikely to get right. We take a 'conditional wisdom' hypothesis to be supported by participants using their cards for the questions they rated as medium difficult, which the audience are in fact likely to be able to help with.

As shown in figure 1, we found a significant linear effect of difficulty ($n=106$; 1.966 ± 0.329, 24.198, $df=1$, $P<0.001$), which is what the unconditional wisdom hypothesis predicts, and which undermines the conditional wisdom hypothesis. We conclude that 'the folk' are not sensitive to the circumstances under which majorities should be deferred to, and fallaciously treat the crowd as an unconditional source of wisdom.

Figure 1: Likelihood to ask audience (yes=ask, no=don't ask) co-varies with difficulty of the question

List, C. and Pettit, P. (2011). Group Agency. Oxford University Press.
Sunstein, C. (2006). Infotopia. Oxford University Press.

Claire Field.
The implausibility of Chomsky's competence- performance distinction

Chomsky's competence-performance (C-P) distinction attempts to fulfil two roles simultaneously: one of explaining what it is that enables speakers to use language as they do, and one of specifying the appropriate object of linguistic study. I will be assessing how plausible the distinction is, by which I shall mean the extent to which it is able to fulfil both of these roles in a way that is explanatorily adequate. I will conclude that Chomsky's distinction is not plausible. It cannot fulfil both roles in a way that is explanatorily adequate.

David Spurrett and **Blaize Kaye**.
Herbert goes to Monte Carlo: Distributed control and the problem of ef cient action selection

Nearly 25 years ago Brooks' (1991) manifesto for 'Intelligence without representation' argued that intelligent behaviour depended neither on representations nor on architectural centralization in control systems. Instead, he maintained, appropriate behaviour could be cued by environmental contingencies, implemented means of largely parallel systems linking contingency and response. Brooks' claims set off considerable and sometimes heated debate, and his views continue to be referred to by philosophers explicitly concerned with human cognition. Most of the debate concerned the possible roles for representations of the agent-external environment. These 'epistemic' representations are (possibly) valuable in interpreting and modelling the external world, and planning actions within it. Relatively little debate focused on issues relating to we call 'motivational' representations, that is representations of the values of world states, the possible returns from actions, and the states of internal variables relevant to prioritising between available behaviours. We're interested in motivational representations.

In some cognitive and behavioural literatures, in sharp contrast to Brook's views, it is common to argue that achieving some sorts of order in behaviour, or efficiency in action selection, requires that the processes selecting actions represent the (expected) values of actions or their results in a 'common currency'. The relevant notion of efficiency here is sensitivity to trade-offs between multiple sometimes incompatible goals. Related considerations are used to argue for the existence of a 'final common path' in the action selection architecture, both to prevent a body from attempting mechanically impossible actions and to serve as the functional place over which competing goals express their competition.

Here we bring these lines of thinking together. We argue that Brook's notion of 'intelligence' is most interestingly understood, although he is not explicit on this point, as including efficient action selection. If the position that Brooks represents is correct, then efficient action selection requires neither a final common path nor any representations at all, including motivational representations. But if the defenders of common currencies and final common paths are correct, then the opposite is the case. Matters are complicated by the fact that Brooks, as well as some of those influenced by him in philosophy, can be understood as making claims of varying strength - either that central, representational cognition cannot work, or that there are no known examples of it working, or that it is less efficient that distributed non-representational control.

We argue that, in the case of motivational representations and final common paths, there are compelling counter-examples to all three claims. Some natural and some artificial control systems exhibit final common paths, token approximately common currencies on them, and meet demanding criteria of efficiency. In addition other kinds of efficiency, especially in learning to respond appropriately to varying returns from actions, plausibly require representations of value.

Although we argue for the necessity of some kinds of motivational representation for efficient action selection, our arguments are largely compatible with the rejection of epistemic representations. They also involve no conflict, and rather make common cause, with arguments in favour of 'action-centric' representations

Deborah Marber.
On addressing prejudice by watching our mouths: pausing on Leslie's linguistic revisionism towards generic language regarding social kinds

I argue that the experimental evidence gathered by Leslie and her collaborators is insufficient to demonstrate that generics significantly precondition striking property generalization by disputing that these psychological experiments truly demonstrate the connection between generics and essentialization. This suggests that until she can provide further evidence of this connection, the linguistic revisionism towards generic language with respect to social kinds that she recommends in order to reduce prejudice is unjustified.

Diana Mazzarella and **Nausicaa Pouscoulous**.
Becoming a competent comprehender: The interaction between pragmatics and epistemic vigilance in development

Sperber (1994) suggests that pragmatic competence may develop following three distinct stages: 'naïve optimism', 'cautious optimism' and 'sophisticated understanding'. These stages would correspond to the adoption of increasingly sophisticated interpretative strategies that allow children to cope with misunderstanding or intentional deception. Crucially, they differ with regard to the underlying assumptions concerning the communicator's competence and benevolence.
The question arises of what cognitive mechanisms underpin the deployment of more sophisticated interpretative strategies. In this paper, we review the literature on infants and children's early communication skills and propose that the development of pragmatic competence is buttressed by the unfolding of epistemic vigilance capacities in the child's cognitive development. Epistemic vigilance comprises a suite of cognitive mechanisms which have evolved in order to minimize the risk of misinformation from communication (Sperber et al., 2010). The assessment of the communicator's competence and benevolence plays a crucial role in the process of filtering out testimonial information. This very same assessment is responsible for the recovery of the communicator's intended meaning via pragmatic inference.
Infants seem to be able to take into account the communicator's competence when interpreting her communicative acts from about 12 months of age, but they take for granted that the communicator is behaving benevolently until much later in development. This might explain the relatively late acquisition of pragmatic phenomena such as irony comprehension (which typically emerges around the age of 6).

As Mascaro and Morin (2014) suggest, baseline expectations about the reliability of communicators and communication undergo significant changes in development. While young children would have higher baseline expectations, these would be revised downwards in development. This revision, together with an improved capacity to track the speaker's epistemic and intentional states, is the precondition for the display of sophisticated interpretative strategies.

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Eva Reindl, **Sarah Beck**, **Ian Apperly** and **Claudio Tennie**.
On the physical cognitive origins of human tool culture

Humans have long been regarded as the sole tool users in the animal kingdom (Oakley, 1976), but today we know that the ability to use and manufacture tools is widespread (Laland & Hoppitt, 2003). Two of our closest living relatives, chimpanzees and orangutans, have even been shown to possess rich tool cultures, superficially resembling human cultures (Whiten et al., 2001; van Schaik et al., 2003). Nevertheless, the complexity and diversity of human tool cultures seem unique. Attempting to identify why and how human tool culture is unique, research has focused on studying social learning mechanisms across species, since high-fidelity social learning is argued to be a key factor in the production of cumulative culture (Boyd & Richerson, 1996).

To explain how human cultures are different from non-human great ape cultures, Tennie, Call, and Tomasello (2009) have brought forward the Zone of Latent Solutions (ZLS) theory. It states that while humans' propensity to imitate and teach others has allowed us to use and make tools which we could not invent individually (take, for example, the steam machine or the computer), tool use in non-human great apes is largely acquired via individual (re-)inventions (latent solutions).

In contrast to the research effort on human social learning in the tool-use domain (Whiten, Caldwell, & Mesoudi, 2016), not much is known about our spontaneous tool-use abilities, i.e. humans' ability to invent tool-use behaviours on their own, without social learning. We recently conducted the first explicit latent solution test in humans to shed some light on the contents of the human ZLS with regard to tool behaviours. For this, we investigated which tool behaviours shown by chimpanzees and orangutans in the wild could also be invented spontaneously by young children. Would children's basic tool-use abilities be on a similar level as the non-human great apes ones? Or would human reliance on cultural learning have led to the basic physical cognition abilities underlying our tool-use culture become degraded?

We presented 50 2- to 3.5 year-olds with 12 problem-solving tasks based on tool behaviours of wild great apes. According to the frequency with which these behaviors occur in the wild, we classified the tasks into low-frequency and high-frequency tasks. We scored whether children spontaneously picked the tool up, whether they invented the correct tool use behavior, and whether they succeeded on the task.

Results showed that children invented the correct tool-use behaviours in 11 out of 12 tasks. In addition, we found that in high-frequency tasks, children were 4.4 (95% CI [2.1; 9.1]) times more likely to succeed than in low-frequency tasks, and this was stable over the age range investigated. This suggests that tool behaviours which occur less frequently in great apes are also harder to invent for children.
We identified several tool behaviours which humans can invent without the need to rely on cultural knowledge. This suggests that the physical cognition abilities underlying basic tool use might not differ much between humans and non-human great apes.

Gaye Soley, **Pınar Aldan** and **Pinar Üstün**.
Children's generalizations of shared knowledge across different social categories

Young children use a wide variety of cues, including race, gender and language, to divide their social world into categories and to make adaptive social choices based on these cues (e.g., Kirsher & Furby, 1971; Alexander & Hines, 1994; Kinzler, Dupoux, & Spelke, 2007). However, it is unclear to what extent these social categories map onto groups. For example, boys and girls form different categories, but they are not constitutive of social groups, as most girls do not know most other girls. Hence, it is critical to ask which cues children use to identify members of their in- or out-groups.

Shared cultural knowledge is a potential cue about group membership. For example, if children know a song, they likely learned it from direct social partners like parents or friends. Accordingly, young children's social preferences are selectively driven by this cue: they prefer others sharing cultural knowledge, and disprefer others who have cultural knowledge they do not share (Soley & Spelke, 2016). Children's social behavior thus might reflect the diagnostic relation between shared knowledge and shared group membership. Here, we explore whether children attribute shared knowledge similarly to individuals of the same gender or to individuals who speak the same language.

Experiment 1 explored the differential attribution of shared cultural knowledge. 5-6 year-old children (N = 10) saw a photograph of a target child and listened to a short sound clip that was identified as the voice of the target child. Participants were then shown two other children. One matched the target child in terms of gender, yet spoke a different language, and one matched the target child in terms of language, but not in terms of gender. Participants were then asked which of the latter children knew the same songs as the target child. Each child received six trials with different triads of photographs.

Experiment 2 explored the specificity of attributions of cultural knowledge by testing the attribution of perceptual preferences. Unlike shared knowledge of songs, shared musical preferences might have a variety of sources, and thus do not reliably indicate group membership. Experiment 2 was identical to Experiment 1, except that participants (N = 11, mean age = 6 years) were asked which of the latter children liked the same songs as the target child.

Preliminary analyses show that children are more likely to generalize shared knowledge of songs across individuals who speak the same language, but tend to generalize shared preferences for songs across same-gender individuals. A mixed ANOVA with social category (language vs.

gender) as within-factor and inference type (Shared knowledge vs. Shared preference) as between-subjects factor revealed a significant interaction between inference type and social category ($F(1, 19) = 5.29$, $p = .033$).

These preliminary results suggest that young children are remarkably selective in their inferences based on social categories like gender and language: They selectively infer shared states of cultural knowledge among those children who speak the same language, suggesting that young children use language but not gender as a marker of social group membership.

Gina Eickers.
Blushing and Social Coordination: A case against simulation theory

Blushing is a unique expression – it is an automatic reaction that cannot be controlled, it is immediately linked to social situations, and humans are the only animals capable of blushing. This uniqueness makes the blush a highly interesting phenomenon for theories of social interaction. In this paper I argue that blushing is a phenomenon that clashes with the simulation theory of social cognition and interaction: simulation theory cannot explain the actor-observer interaction in a blushing situation. Even if low-level simulation seems to plausibly explain the blushing scenario at first glance, difficulties with this explanation occur when taking a closer look on empirical studies on the actor-observer interaction in a blushing scenario. Instead, I argue, blushing and the social interaction during, preceding and following the blush need to be investigated via a theory of social coordination.

Gloria Andrada.
Extended Cognition and Cognitive integration: artefacts, cognitive systems and cognitive characters

Introduction.
The Hypothesis of Extended Cognition (HEC) is the claim that extra-neural structures can be included among the physical vehicles of cognitive processes. The basic idea is that the material realization of cognitive processes is wide and can include non-organic elements (a biochip, a silicon neuron or a notebook). HEC argues for a parity of treatment between cognitive processes located "inside the head" and elements located outside: as long as they are functionally equivalent then the process in question can count as cognitive. As a result the "cognitive" mark is not location of a process but the role it plays in the overall performance of the cognitive system. The possibilities of what can count as a cognitive vehicle are expanded and, among everything, must not be guided by neuro-centric prejudices.
The idea that cognitive processes can include trans-organic elements calls for a revision of certain epistemic notions, evaluations and debates given that most epistemic accounts have endorse a form of epistemic individualism (where faculties, abilities, virtues are internal to the organism). In most of the cases where we imagine an information-processing event located outside the boundaries of an organism, we would hesitate before considering it part of an agent's constitutive knowledge-conducive processes. Imagine, for instance, google or a nowadays old-fashioned encyclopedia. At first it is quite difficult to consider them part of someone's constitutive abilities but a mere aid or tool to her own cognitive set.

It is important to bear in mind that HEC is not built on disability or specific high-tech use: its general claim is that cognitive off-loading has been going on for a long time in human evolution and is a main characteristic of human cognition. However, as we become increasingly technologically embedded in information-laden environments a study of the epistemological ramifications of extended cognition proves itself more important. The focus of this paper is precisely this actual debate.

Given the broad nature of this task, I am going to focus on the notion of cognitive integration and my goal is to present the connection between epistemic cognitive integration and cognitive integration as a model of mental architecture in the context of cognitive extensions. The overall objective is to show the possible theoretical bridges and connections (if any) between the notion of extended cognitive systems and extended (epistemic?) cognitive characters. By attending to the different notions of integration, I will point out to the idea that there is nothing that prevents artefactual or artificial processes from becoming integrated in an agent's cognitive system, and perhaps, in an agent's cognitive character. As a result, externalist epistemology can be easily accommodated with a form of epistemic anti-individualism, where a subject's cognitive resources are not entirely 'internal' to the agent, such as in the famous case of Otto and his notebook. Without committing myself to this claim, my overall objective is to show the possible theoretical bridges and connections (if any) between the notion of extended cognitive systems and extended cognitive characters. And, as a result, to bring some light on the more general problem of the relation between analysis at personal level and at a subpersonal level; in other words, both on the level of content and on the level of processes.

Please bear in mind that this is a work in progress, but at this stage of the process, this presentation is organized as follows:

Section I focuses on cognitive integration and HEC.

Section II is devoted to the epistemic notion of cognitive integration and cognitive character in relation to HEC, which as we will see will shed some light on the notion of extended cognitive agency.

In section III I offer a brief comparative analysis of both notions.

I. Cognitive Integration and HEC

Within cognitive science, the notion of integration usually refers to the interconnectedness and interplay between the different cognitive capacities (traditionally considered to be brain-based) that make up a cognitive system. The idea of how integration occurs has lead to different models of cognitive architecture. This can be easily illustrated by the traditional debate between modular models based in Fodor (1983) and connectionist ones. But recently, mainly due to debates concerning HEC, the notion of cognitive integration has been receiving more and more attention. The main reason is that the claim that external elements can be proper parts of an agent's cognitive system needs to be backed by an account of how such external elements can be integrated into the organic cognitive system, otherwise it would result into mere theoretical vagary.

HEC is based on the idea that when parts of the environment become 'properly coupled' or properly glommed onto an agent's organic cognitive system, then, they can be considered as constitutive parts of the overall cognitive mechanism, therefore it could be claimed that cognition potentially extends to elements of environment that the agent is immersed in. And this "proper coupling" or attachment can be read in terms of integration (or at least that is my reading on the matter), that is what does it take for an external resource to be glommed onto the organic cognitive system, such that it forms one overall integrated system.

It is the functionalist approach to the mind that HEC rests on is what allows the claim for a parity of treatment between cognitive states that are located "inside the head" and elements located outside. Based in this functionalist premise, in the first program of HEC, its authors proposed what has become known as "glue and trust" criteria (Clark and Chalmers, 1998, Clark 2010). "Glue" because the external element or resource must be available when the agent needs it and "trust" because the agent must trust what the resource come up with. Clark (2010) emphasizes that the availability, accessibility and portability of the resource in question might be crucial. As a result functionalism and the" glue and trust" criteria offer as a plausible model of cognitive integration : processes might be causally connected and must be available, accessible and automatic (the agent in question must trust its results). However, we find in the literature many critics to the different conditions that have been proposed, mainly due to its sloppy and broad nature. According to these views, artefacts are therefore reduced to play an instrumental role but not a constitutive one. At this moment, I would like to bring your attention to the fact that matters for the purpose of this presentation is that it is the very notion of cognitive integration (and the claim of lack of proper integration in the cases HEC examines) what has led some authors to reject this program. For instance, in his book "Cognitive Systems and the Extended Mind", Rupert argues that cognition is an activity of an integrated system located exclusively within the human body. His main idea is that proper integration among mechanisms is what works as a criterion for determining why an external resource cannot be treated as cognitive. Rupert suggests a notion of integration based the relative probabilities of use of the different mechanisms that each organism requires to manifest a certain cognitive phenomenon. His idea is that cognitive mechanisms interact deeply and are mutually affected by each other creating a net of mechanisms based on high probabilities of use. Consequently mutual interaction creates general patterns which indicate which mechanisms are part of the integrated set and therefore identified with the cognitive system and which are, in contrast, resources used by the cognitive system (lower frequencies of use). As a result, Rupert excludes external resources with which the organism couples in order to execute specific tasks, because according to him, their recruitment is not due to "general patterns". The organism interacts and depends on external organizations in the execution of cognitive tasks and this entanglement is explicatively relevant but positing fleeting cognitive capacities is jumping too far.

Although I agree with Rupert in that recognizable cognitive mechanisms that are used in cognitive explanations need to satisfy scientific desiderata of simplicity and conservadurism, there is not an a priori reason to reject that this mutual interaction cannot be satisfied by external elements, but something that needs to be further explored (both empirically and theoretically). A promising solution to these problems comes from Dynamical System Theory (DST) (Palermos, (2012, 2014) and Beer (1995)). There has been an effort to present it as a better model of cognitive systems and HEC compared to simply common-sense functionalism. The main idea is that continuous mutual interactions between the organismic agent and the artifact are both necessary and sufficient for cognitive extension. Clark (2008) has named this two-way interaction as 'continuous reciprocal causation' (CRC). An agent's internal cognitive capacities can mutually interact with some environmental element and conform an extended cognitive whole whose behavioral competence will be impoverished or blown away if the external component is removed. More empirical work is needed in order to explain how non continuous mutual interactions (between an external element and the agent) give rise to those non-linear relations that constitute an extended cognitive system. Nevertheless, non-linear relations based on DST could help us picture how cognitive capacities are intertwined with each other, and respond to several worries concerning HEC: the coupled system's competence would drop just as it would drop if one were to remove a part of someone's

organic brain. This would entails Otto's brain-based processes interact with the external processes in the notebook, creating a new brain-body-notebook system that has new processes not had by Otto alone or by his notebook alone.

II. Epistemic cognitive integration and HEC

The notion of cognitive integration has also been brought to the fore in epistemological debates in relation to our epistemic cognitive characters. Among others Greco (2010) and Breyer (2015) have defined the notion of cognitive character as a causally integrated system of cognitive mechanisms (or dispositions) all of which are aimed at truth. Also, Pritchard (2010) defines cognitive character as an agent's "integrated web of stable and reliable belief-forming processes". The idea of cognitive character suggests the need for certain kind of cohesion among different processes. In relation to HEC, what is at stake is that an agent can be credited with knowledge by an external process, in a sufficiently similar way as an agent through a non-extended process. This has lead to the formulation of Epistemic Parity Principle (EPP), which following Adam Carter (2013) would consist of the following:

EPP : For any agent S and true proposition p, if S comes to believe that p by a process which, were it to go on in the head, we would have no hesitation in ascribing knowledge that p to S, then S knows that p.

First of all we can ask ourselves: Why should an HEC advocate care about EPP? Well, once we concede that cognitive processes can be extended, then the idea that cognitive processes are epistemically deficient relative to their non-extended counterparts could bring serious doubts to whether they should be regarded as the same kind of cognitive processes and mental states at all. This would entail that extended processes do not share the same essential epistemic properties with their unextended counterpart and then it could easily be argued that they are not genuinely cognitive in the first place, therefore running counter to the relevance of HEC. Also, leaving the truth of HEC aside, the possibility of extended knowledge (coupling between artefacts and organic cognitive abilities) can open new ways of looking at technology, and this is something of growing interest in our society where we are more and more technologically mediated.

There is a shared intuition among contemporary epistemological approaches that knowledge obtains if it results from the deployment of certain cognitive ability (the burden that the different views place on the deployment of a cognitive ability vary but most of them share the idea that at least some cognitive ability must be exercised for knowledge to obtain). This intuition captures the idea that we expect agents worthy of cognitive success when they use their own specific abilities to a significant degree (that is, it is a necessary condition but not a sufficient one). As a result, the question regarding HEC and EPP adds up to what makes a belief forming process one of my own set of cognitive abilities, such that through an external process an agent can be said to be acquiring knowledge by her own cognitive agency.

And this is where the epistemic notion of cognitive integration comes in handy. Among others, Duncan Pritchard (2010, 2014) has argued that in order for an instance of knowledge to satisfy the AI, it must be to a significant degree of a belief-forming process that is integrated into the subject's cognitive character. The main question therefore turns into what makes a process integrated. If an external process is integrated, then the process in question is a cognitive ability, therefore the agent shows some degree of agency in acquiring knowledge through an external process. In Pritchard's previous definition, we find two important aspects associated with integration: reliability and stability. Intuitively, for an agent to be said to properly know something she must have grounds for its reliability. Notice that we don't need reflective grounds. The core idea behind the idea of

epistemic cognitive integration is that full-fledged cognitive agency is the result of the combination of an integrated cognitive character with a commitment to attaining the truth. In fact it is precisely the idea of epistemic cognitive integration what offers a minimalist yet adequate epistemic norm of subjective justification, overcoming the problems posed by process reliabilism (as well as the well-known problems entailed in internalist approaches to justification in terms of reflective grounds): as long as the agent's belief-forming process has been integrated in her cognitive character, the agent can be justified in holding the resulting beliefs merely by lacking any doubts there was something wrong in the way he arrived at them (Greco, 2014).
Epistemic Cognitive Integration creates what some have called "psychological comfort" (Breyer, 2015). Consequently, the lack of integration (which results in the lack of a proper subjective justification) will entail a fragmented cognitive character therefore an impaired cognitive agency. That is why, in a similar way to integration among mechanisms, epistemic cognitive integration excludes fleeting processes because they are not properly integrated so they cannot count as character traits. Epistemic Cognitive Integration emphasizes normality, stability and reliability of the process as key. The process must not be strange, in the sense that it must not be at odds with the rest of the agent's cognitive system. This emphasizes the interconnectedness of our cognitive abilities. As a result, despite the fact that there is not a consensus on what is necessary for epistemic cognitive integration, we get the idea that it entails certain reliability, stability, normality and dispositionality of mechanisms is what form our more or less integrated cognitive character. And, all I can say at this point is that it seems quite straightforward to see the the relation between this notion and the notion of cognitive integration entailed by HEC, at least in the first version of the program.

III: Extended systems and extended characters
As we have seen, the idea that cognitive processes can include trans-organic elements calls for a revision of some epistemic notions given that most epistemic accounts have traditionally endorsed a form of epistemic individualism where cognitive resources are individually conceived (faculties, abilities, virtues are internal to the organism). Also, I have briefly shown that while the notion of cognitive integration within philosophy of mind emphasizes the way cognitive mechanisms interact giving rise to a complex cognitive system (and therefore different models of mental architecture), the epistemic notion of cognitive integration focuses on the connectedness of our belief-forming processes that make up our cognitive character what some authors have referred to as our integrated web of belief-forming processes and cognitive traits (Greco, 2010, Pritchard, 2012, Breyer 2015, among others).
The two notions can be compared in the following table:
Cognitive Integration
Epistemic Cognitive Integration
Cognitive System
Cognitive Character
Cognition
Knowledge
Interconnectedness of mechanisms
Interconnected belief-forming processes

We have seen apart from the traditional skin chauvinism, location is not key for cognitive integration nor for epistemic cognitive integration (given of course, that we accept the parity

principle). Also, as we have seen, if we attend at HEC scenarios, we find that there is some restriction for cognitive extension. It makes sense, as the claim that artifacts can be part of an agent's cognitive system presupposes an account of how such external elements can be properly integrated into our cognitive loops. Regarding epistemic cognitive integration and extended cognition, also there is not any principled reason to reject that external processes can be integrated among a subject's cognitive character. At this point I can argue that the original criteria of the first program of HEC can be easily read in epistemological terms.
However more needs to be said in relation to different models of cognitive integration and about the relation that holds between cognitive integration of mechanisms and capacities and our epistemic cognitive characters. Empirical cases where someone's capacities are impaired could help us see the relation between impaired cognitive agency and the cognitive architecture behind. Doubtlessly the debate is still open for discussion.

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Haim Cohen, **Ittay Nissan-Rozen** and **Anat Maril**.
Moral Judgment: Belief-Like or Desire-Like?

Contemporary psychological studies of moral judgments take them to be of a binary nature. In the philosophical literature, however, it has become common in the last ten years to treat moral judgments as graded attitudes i.e. attitudes that are scaled as degrees of moral judgments (DMJ). This study investigates a question that has both philosophical and psychological aspects: Should DMJ be taken as degrees of beliefs and capable of being represented by a probability function, or as degrees of desirability and capable of being represented by a utility function? In other words, is DMJ belief-like or desire-like? In the philosophical literature, this question is discussed from a normative and a conceptual perspective. Our study aims to shed new light on this debate by examining the question from an empirical perspective.

In the study, we rely on the normative claim that a necessary condition for the rationality of degrees of belief is conformity to the third axiom of the probability calculus:

(p3): IF $P(A \cap B)=\varnothing$ then $P(A \cup B)=P(A)+P(B)$.

In contrast, P3 is not a necessary condition for rational desire. Thus, the hypothesis of this study is that P3 will distinguish between degrees of belief and degrees of desirability in the real world as, we take it, most people, most of the time, are rational.

We constructed three types of statements in which the root element was identical between the three conditions: Beliefs (to what extent do you believe that x?), Desires (to what extent do you desire that x?) and Moral Judgments (to what extent do you deem it appropriate to act x?). Critically, each statement had two complementary versions in which the possible outcome was either p or q and the conjunction was impossible, thus enabling us to measure subjects' responses to the same dilemma. Six groups of subjects were tested in a between-subjects design. Subjects reported either their degree of belief or desire or moral judgment to one of the complementary versions of each of forty-two dilemmas.

Based on preliminary findings, (a) results confirmed the hypothesis that P3 is a criterion for distinguishing degrees of belief from degrees of desirability, (b) there was a significant difference between desires and beliefs. As for the main question of whether DMJ are belief-like or desire-like, preliminary results suggest a significant difference between DMJ and desire, but no difference between DMJ and belief. Thus, results support the conclusion that DMJ are belief-like.

However, DMJ may operate differently for distinct populations. Responses of self-defined left-wing and right-wing Israelis tested the hypothesis that DMJ act as beliefs for one group and as desires for the other. Preliminary findings indicated a significant difference between left-wing and right-wing Israelis only in DMJ, but not in beliefs or desires.

These results give rise to a radical philosophical hypothesis: Meta-ethical debates regarding the structure of DMJ might be context-dependent. DMJ may be represented by a probability function as belief or by a utility function as desire, depending on agent-specific factors.

Javier Gomez-Lavin and **Matthew Rachar**.

Joint actions as normatively constituted

Theories of collective intentionality dominate philosophical discussion regarding joint action. These theories differ in regards to the role of normative relations, e.g. obligations and entitlements between the participants in the constitution of joint action. Normativists like Gilbert (2014) argue that joint actions always involve these normative relations. In contrast, non-normativists like Bratman (2014) argue that joint action is possible solely on the basis of some shared intentional states without any genuine normative relations.

To support their positions, these theorists propose thought experiments that involve individuals undertaking some project together. Their thought experiments are meant to elicit intuitions about the presence or absence of normative relations between the participants of the joint action. Both camps take their examples to be conclusive. Despite this certainty, there is a dearth of empirical research on said intuitions.

We have conducted six experiments to determine whether participants attribute normative relations in cases of joint action, and to isolate salient features of these thought experiments, which —when

altered—significantly affect participants' judgements about the existence of genuine normative relations. Studies one through four use vignettes derived from the joint action literature. Each study shows that merely implying joint action (e.g., through subtle behavioral cues) significantly increases participants' judgements of the existence of normative relations among the characters (e.g. study three: M =3.95), compared with control conditions (M = 0.64, $t(110) = 11.56$, $p < .001$, Cohen's d = 1.51). Study five demonstrates that the effect is symmetric; increasing evidence of normative relations (e.g., judgmental glances) significantly alters participants' judgements about the presence of joint action among the characters (M = 4.02), compared with control conditions (M = 1.94, $t(105) = 6.505$, $p < .001$, d = 1.26). Study six examines whether the robust effect detected in studies one-through-four withstood cases of morally deviant behavior (e.g., robbing an ATM), which it does (M = 4.33) compared with control conditions (M = 0.98, $t(97.366) = 9.44$, $p < .001$, d = 1.88).

Although our findings largely concur with the normativist account, we have also found variance in the types of normative relations involved in joint actions. These discrepancies suggest several lines of future research.

José Manuel Viejo.

A New Approach to the Hidden Indexical Theories

Regret is a commonly felt emotion, arising from counterfactual thinking about how one's actions may have turned out differently. Recent psychological work has addressed the question of when children begin to experience regret, which brain mechanisms are implicated, and to some extent regret in older age. However, as is the case for many psychological processes, regretful thinking in middle adulthood is typically regarded as stable, despite the likelihood that changes in cognitive processes and life experiences will exert influence.

In this study we tested a sample from the general population aged between 18 and 89 (mean age 39.7) using a mobile app. Participants signed up to complete a series of tests and games exploring learning, social cognition, health, and regret. To date 175 participants have completed regret tasks and preliminary data analysis is reported.

Participants completed four different measures of regret: a gambling task in which they reported how they felt after discovering an alternative gamble would have resulted in a better outcome (based on Camille et al., 2004); a risky decision making task which gave a measure of how participants changed their behaviour after large and small missed opportunities (Buchel et al, 2011), the Counterfactual Inference Task in which participants read a short vignette and were asked to describe which of two characters is likely to feel worse (Hooker et al, 2000), and a regretful thinking questionnaire in which participants reflected on their own style of decision making (Schwartz et al., 2002).

There were two broad questions to be addressed: First, how would regret change over the lifespan? Second, how would these different measures of regret relate to each other? Neither reported emotions on the gambling task nor behaviour on the risky decision making task were predicted by participants' age. In contrast, older participants were less likely to use counterfactual thinking to answer the Counterfactual Inference Task ($r = .190$, $n = 175$, $p = .012$) and older participants reported less regret in the reflective regret questionnaire ($r = -.444$, $n = 108$, $p < .001$). There were no relations between regret measurements taken from the four tasks.

Our preliminary data suggest that how people reflect on their own experience of regret and predict other people's regret may change over middle age with older adults being less influenced by regret.

Yet, online decision making measures do not reveal age-related change. Perhaps most importantly, the lack of relations between our measures of regret suggests that there is much to be done in terms of defining this emotion psychologically and understanding its different aspects.

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Julius Schoenherr and **Evan Westra**.

Social Effect on Social Cognition

For now over 15 years, some neuroscientists, cognitive scientists, and philosophers have criticized much existing research in social cognition for its lack of ecological validity (e.g. Michael, 2011; Schilbach et al., 2013; De Jaegher & Di Paolo, 2007; Gallagher & Hutto, 2008). Allegedly, ecological validity can be achieved by introducing novel "interactive" research paradigms to replace prior "observational" experiments. Research in social cognition, it is argued, is ripe for an "interactive turn" (Schilbach et al., 2013).

In this talk I argue that interaction-based research has narrowly focused on the cognitive effects of agent-directed ostensive cues (Schilbach, 2015; Schilbach et al., 2013; Csibra & Gergely, 2006), and feedback loops (Auvray et al., 2009; De Jaegher & Di Paolo, 2007; Przyrembel et al., 2012). I argue that familiarity, mere co-presence, and goal sharing have at least equal relevance for social cognition. However, the latter set of features cannot adequately be characterized as either observational or interactive. Therefore, once the narrow focus on social feed-back and ostensive cues is abandoned one can no longer hope to allot a central role to the interaction/observation distinction as a way to make good on the quest for ecological validity.

Firstly, recent literature on automatic and spontaneous perspective-taking has revealed that mere co-presence of another agent (Tversky & Hard, 2009), and sharing of goals (e.g. Sebanz et al., 2003; Surtees et al., 2016; Frischen et al., 2009) is enough for perspective-taking to take place. For instance, in Tversky & Hard (2009) participants were asked to describe spatial relations between an actor and an object. When the actor's goals were made salient participants were more likely to describe these spatial relations using words that indicate perspective taking; e.g. describing an object as "on the left side", where the object was to the left of the actor, not the participant. In these experiments interactive engagement mediated by participant-directed ostensive cues is explicitly not required.

Additionally, Shimpi et al. (2013) and Matheson et al. (2013) show that when carefully controlling for effects of familiarity and observed communication, the net effect of interaction can be marginal. For instance, Shimpi et al. (2013) found that imitative learning of novel actions is sensitive to toddler-directed ostensive cues only if the interactor is familiar to the infant. In this experiment, 18 month old infants are presented with novel actions (e.g. ringing a doorbell using one's forehead) after a brief warm-up period involving a sorting game. Shimpi found that imitative learning crucially depends on whether the person interacted with later on was already familiar from the warm-up period. Strikingly, they find that "very few children imitated when they had not had any such experience" (Shimpi et al., 2013, 321).

Secondly, feedback loops don't introduce novel features of social engagement; rather, they should be analyzed in terms of causal interactions between interacting individuals. These causal processes are then fully determined by individual level processing (Overgaard & Michael, 2015; Schoenherr, 2016).

For these reasons, ecologically valid research in social cognition should be extended to include features such as familiarity, co-presence, and goal-sharing. This implies, as indicated above, that the stark opposition between observation and interaction is ill-suited as a framework for ecologically valid research in social cognition.

Maria Mammen, **Bahar Köymen** and **Michael Tomasello**.
Children's reasoning about social norms with their peers

While explaining a third person's wrongdoing to someone, speakers must take into account the type of norm violation that person commits. Violations of moral norms (e.g., stealing) do not require elaborate explanations, since moral norms are assumed to be shared among a large number of people as part of a cultural common ground (Clark, 1996). Violations of context-specific social rules, however, require more informative explanations (e.g., why putting yellow toys in a green box is wrong), as they cannot be assumed to be shared with everyone. Previous studies have shown that preschool children are able to distinguish between moral and conventional norms, when they individually evaluate third-party norm violations (Nucci & Nucci, 1982; Smetana, 1981; Schmidt et al., 2012). However, none of these studies investigated how children "jointly" evaluate third-party norm violations with peers or how they spontaneously produce explanations for norm violations in peer discussions. This study, therefore, investigated how preschool peers evaluate third-party norm violations and whether they adapt the informativeness of their justifications according to the type of norm that has been violated.

72 dyads of 3- or 5-year-old peers (N = 144) were asked to jointly punish one of two characters, each of which was known to one of the children in a dyad. While one child in the dyad, the naïve child, individually heard a story about a neutral character, the other child, the target child, individually heard a story about a character violating either a moral norm (moral condition) or a context-specific rule (conventional condition). Then, the children had to jointly decide which of the two characters should get a marble and which one should be punished. We extracted all the justifications the target child produced for the punishment of the transgressor rather than the neutral character. We identified two justification types: 1) informative justifications, that stated

the rule using normative language (e.g. “One should not put yellow cars in green boxes”); or 2) factual statements, which only described actions without spelling out the rule or using normative language (e.g. “She stole.”).
The results suggested that both age groups produced more informative justifications, using normative language, for punishing the transgressor in the conventional condition than in the moral condition, in which they relied on factual justification ($\chi 2 = 30.37$, $df = 1$, $p < .001$).
Overall, 5-year-olds were more likely to justify their decisions for their naïve partner than 3 year-olds were (mean percentage of trials with justifications: 60.2% vs. 33.3%). Nonetheless, our findings suggest that when 3-year-olds did produce justifications, they were able to adjust the informativeness of their justifications according to the type of norm violation they heard.
Thus, our results suggest that already at age 3, children not only understand that moral norms are more widely shared than context-specific rules, but they also begin to use this knowledge to tailor the informativeness of their justifications in their peer conversations. At age 5, children are fairly competent in using their rule understanding when justifying their decisions to a peer.

Mateusz Woźniak, **Dimitrios Kourtis** and **Guenther Knoblich**.
Event-related potentials associated with self-referential processing of another person’s face: Different roles of frontal and parietal contributions to P3

There is a considerable evidence from behavioral and neuroimaging studies that people process their own face preferentially. Similar evidence exists in regard to other self-related information. Moreover, recent research has shown that people can rapidly incorporate neutral stimuli into their self-concept. Based on the previous behavioral studies, our research has focused on the question of whether it is possible to detect a self-referential bias after associating a neutral face with the self. We investigated this using electrophysiological measures.
We ran two EEG experiments with a 64 channel ActiCap system, during which participants first learned the identity of three neutral unfamiliar faces (from Chicago Faces Database, Ma, Correll, Wittenbrink, 2015). The faces were identified as either the participant, a friend or a stranger. After this they had to perform an associative matching task. In experiment 1 the participants were first presented with a face and then, after 1.5 second delay, with a label ("You", "Friend" or "Stranger"). Their task was to judge if the label matched with the previously seen face. In experiment 2 the order of the cues was reversed. The participants were first presented with a label, and then, after a delay period, with one of the faces.
Both experiments exhibited the same pattern of behavioral results. Reaction times were faster if the first cue was associated with the self regardless of the modality and familiarity of the stimulus (a novel face or a known word). The self-association of the second cue did not have a facilitating effect on the response latency. It suggests that the self-prioritization effect is a result of activation of an amodal or cross-modal self-representation, which facilitates the processing of a subsequent stimulus regardless of its association - reactions were faster in both matching and mismatching trials.
Electrophysiological results allowed us to further elaborate on the behavioral findings. First, the pattern seen in reaction times was mirrored by the behavior of the central-parietal P3 following the second cue. In both experiments if the first cue was associated with the self then the second cue elicited a stronger P3 response than in the other conditions. This pattern was present in both matching and mismatching trials, but absent when only the identity of the second cue was taken into account. Second, the association of the first cue led to modulation of the frontal contributions

to P3 immediately following the presentation of the first cue. In both experiments presentation of a self-related stimulus led to stronger frontal P3 than presentation of a friend- or stranger-related stimuli. These results can be linked to the recent theory of Self-Attention Network by Humphreys and Sui (2015), where they postulate that self-related cues are first processed in the ventral medial Prefrontal Cortex in a bottom-up manner and later subsequently influence the processing in the posterior part of the ventral attention network

Michael Messerli and **Kevin Reuter**.

Hard Choices

In hard choices, people are faced with two options neither of which is conceived of as better, worse, or equally good compared to the other. Most philosophers claim that hard choices (i) can indeed be distinguished from cases in which two options are equally good, and (ii) can be characterized by a failure of transitive reasoning. So far, however, none of these claims and interpretations have yet been tested. This paper presents the first empirical investigation on hard choices and intransitive reasoning. Our results reveal that hard choices present real-world dilemmas in which a significant majority of people violate transitivity.

Monika Bystroňová.

Inconsistent Moral Mind: Asymmetries in Folk Moral Evaluation

The main aim that I pursue in my paper can be briefly described as an attempt to understand how people perceive moral agents, how they ascribe moral concepts to them, and on what basis they blame a punish them.

When evaluating agent's act, the evaluating process can have several stages: we assess whether the agent had control over his actions, whether he acted freely, whether he acted intentionally and then on the basis of these information we determine agent's blameworthiness and the sufficient punishment agent really deserves. On every stage of this moral evaluation, we want to make sure that our verdict is based on morally relevant factors like agent's mental states, etc. However, various strands of research show that people are to a large extent susceptible to various cognitive biases. When they fall prey to them, it leads to several interesting asymmetries in moral judgment – they evaluate two situations that are identical in relevant respects differently. In fact, various asymmetries were documented on every stage of this evaluation process.

The main aim of this paper is to put into context these branches of research in the area of morality that discovered asymmetrical ascriptions of moral concepts. I will focus on several studies and present at least three types of asymmetries: First, I will focus on asymmetry in ascribing intentionality to a moral agent caused by different moral valence either of a side-effect or situation itself, discovered by Joshua Knobe (2003a; 2003b). Second asymmetry arises from interaction of two different factors in our moral judgments when confronted with cases of moral luck (Young, Cushman, Hauser & Saxe, 2007; Young, Nichols & Saxe, 2010): (i) the assessment of causal responsibility for harm, (ii) the assessment of intent to harm. Also, I will present an interesting phenomenon called "blame-blocking" (Cushman, 2008). And finally, I will analyze the last asymmetry found in research of culpable causation (Alicke, 1992; 2000; Nadelhoffer, 2006) which

explores influence of the perceived blameworthiness of an action on judgments of its causal impact on a harmful outcome.
I will focus on these particular studies because, in my opinion, the authors use the same package of components that are considered in each scenario and coincidentally this package happens to be a model of folk concept of intentional action proposed by Knobe and Malle (1997) – desire, belief, intention, awareness and skill. Therefore, using these five components allows me to compare these scenarios and to find out which factors make people to judge agents more leniently or harshly.
An important part of my paper is to thoroughly think about implications of such research – not only about consequences that these studies have on philosophical theories of intentional action or moral luck, but also consequences for the theory of mind or the law. Also, I will present some real court cases that will show that these asymmetrical judgments people seem to have are a real threat to our legal system.

Nicola Cutting and **Sarah Beck**.

Children's preference for tools that look 'more made'

Humans are surrounded by artefacts. Looking around your home there are likely to be very few natural kinds. We seem to be drawn to artefacts, especially the latest technology. This can be seen from a very young age, with children under 2 being remarkably competent with smart phones and tablets. Do we really prefer artefacts over natural kinds? And why might this be? Perhaps it is due familiarity, a desire to learn about function, or maybe they just look interesting. There may also be an evolutionary advantage of being drawn to artefacts; it is likely to be beneficial to investigate something which someone else has made. You may learn a new skill, or a more efficient way of achieving something. You might be able to obtain or do something you couldn't previously.
Most of what we learn about artefacts is through direct social learning. We observe others interacting with objects and then learn via various social learning mechanisms. Human culture means that we learn about artefacts quickly and efficiently through direct social learning, but we may also have the ability to learn via alternative processes. Through indirect learning we may be able to learn about objects simply by recognising that they have been made, modified or perhaps even decorated, without seeing anyone actually interact with them.
By testing for the possibility of indirect learning in children, the current research will be able to feedback findings to the biological literature. Identifying indirect social processes has the potential to inform us how non-human animals learn about artefacts and objects.
In the first studies on this topic we tested for a preference for artefacts in children aged 4 to 8 years ($N = 108$). In Study 1, children were presented with a horizontal plastic tube containing a sponge with sticker attached. Children were told to push the sponge out of the tube in order to win the sticker. Children played the game twice. On each attempt they could choose from two tools (twig or plastic rod; plain wooden dowel or decorated dowel). Children preferred to use the plastic rod over the twig ($p < .001$) and the decorated over the plain dowel ($p = .009$). To ensure that children were not simply matching the colourful and plastic tools to the plastic tube, in Study 2 we used the same tools but a new group of children ($N = 53$) needed to retrieve a small stick from a hollowed out log. Again, children preferred to use the plastic rod ($p < .001$) and the decorated stick ($p < .001$). These findings suggest that children have a preference for artefacts over natural kinds, and prefer tools which appear to be 'more made'. This study provides a base from which we can now build a series of studies to investigate the mechanisms underlying our preference for artefacts.

Pamela Barone and **Antoni Gomila**.

The developmental paradox of belief understanding: an interactive dual-process solution

Several researchers, mainly guided by children's dual performance in false belief tasks, have suggested that humans have two systems for attributing beliefs and other mental states. In the present contribution, we will analyse whether and to what extent a dual process account makes sense for false belief attribution and which approach, if any, best explains the empirical evidence. First of all, we will present different versions of dual process theories that have been put forward in social cognition, and we will criticise their conception of the two processes as due to two independent systems. Secondly, we will analyse Carruthers' proposal on mindreading, as he does provide an explanation of the relationship between both kinds of processes. Next, we will argue that Carruthers approach is unsatisfactory for it considers mental attribution as an inferential and representational process, dismissing the role of intersubjective engagements and the sensorimotor basis of cognition. Finally, we will provide an alternative explanation of the relationship between both processes, considering the basic level from a dynamic, second person framework.

Philipp Rau.

The self as a system

'The self' has been conceptualized in various ways—as subject of experience, locus of 'personal identity', fictional construct, moral and social agent, etc. (Gallagher, 2011). P.S. Churchland (2002) suggests that we should understand the self 'in terms of self-representational capacities' ranging from lower-level self-representations essential for sustaining homoeostasis, through sensorimotor self-representations, to higher-level self-representations like autobiographical memory, action planning, impulse control, or situating oneself in social interactions. Developing this idea, I suggest that the self is a neurocognitive system of self-representational processes.

This conception of the self ('the system view') avoids the pitfalls of viewing the self as a narrative construct, a fashionable conception among philosophers, social psychologists, and psychiatrists (Dennett, 1992; Bruner, 1994; Schechtman, 1996; Phillips, 2003). I do not dispute that self-representation over time makes use of narrative practices, in public self-presentation and in 'narrative thinking' (Goldie, 2012). Narrative practices rehearse and consolidate memory, and we produce various self narratives in response to social situations. However, this does not entail that we 'construct' a self narratively. The main difficulty with this approach is what I call the authorship problem: if the self were a narrative construct, who or what would then be the author of those narratives? On the system view, it is the self qua self-representational brain activity that, inter alia, produces our self narratives (and not our self narratives that produce the self). My approach also avoids limiting the self to narrative activity. For our higher-level self-representations aren't only narrative—they also include implicit memories, character traits, attitudes, affective and behavioural dispositions. This is particularly relevant to individuals who may have no narrative capacities to begin with, as may be the case in autism, or when explicit self-representational activities like remembering and narrating are impaired by neural damage or degeneration.

The system view is consistent with diverse psychopathologies that affect some elements of the self but not others. In cases of advanced dementia, most explicit autobiographical memory is lost or inaccessible. On a Lockean view of the self (Locke, 1690), such memory loss would entail the loss

of self. But dementia patients often retain other components of their selves—affective dispositions, some self-recognition, knowledge of character traits, and other implicit memories (Hehman et al., 2005). Since, on the system view, the self is not an all-or-nothing affair, some of its functions may be preserved while others deteriorate. Thus, conversely, it is possible for autobiographical memory to be intact while other higher-level self-representational functions are impaired, as is the case in schizophrenia, where a sufferer's thoughts are misattributed to outside sources ('hearing voices', 'thought insertion'). Here too it would be unhelpful to characterize this condition as a wholesale loss or dissolution of the self. Rather, it is a malfunction of specific self-representational processes. And a malfunctioning system is still that same system

Regina E. Fabry.

Enculturated Predictive Processing

Recent work on enculturation suggests that socio-culturally shaped cognitive practices emerge from an individual's scaffolded, embodied interaction with its cognitive niche. This structured engagement with specific, socio-culturally developed cognitive resources (e.g., writing systems) in the niche transforms the overall cognitive capacities of an individual. The acquisition and the performance of specific cognitive practices (e.g., reading and writing) are shared by a large number of individuals in the cognitive niche. Accordingly, cognitive practices have a normative dimension that is especially important during the early stages of their acquisition. On a sub-personal level of description, the process of enculturation is associated with significant changes in the functional and structural properties and the connectivity patterns in the brain. Furthermore, it alters and refines the functional profiles of embodied actions and motor programs.

Emerging predictive processing accounts of cognition offer unifying mechanistic principles that characterize these cerebral and bodily developmental trajectories. Predictive processing is the idea that the brain needs to minimize any discrepancies between top-down predictions and bottom-up prediction errors at multiple scales of space and time. On this view, the constant interaction of perceptual inference and active inference and the ensuing update of the hierarchical generative model realized in the human brain establish and refine specific cognitive processing routines.

In my presentation, I will argue that PP offers important conceptual tools and theoretical considerations that complement the basic principles of enculturation. The resulting new framework, which I call enculturated predictive processing (EPP), has the conceptual resources to consider specific cases of enculturation on sub-personal, personal, and supra-personal levels of description. In particular, the EPP framework offers characterizations of the complex and dynamic development of cerebral processes and embodied action repertoires. Furthermore, it suggests that the personal-level description of the process of cognitive skill acquisition reveals the complexity and fragility of enculturation. Finally, the supra-personal level consideration of scaffolded learning and of the trans-generational process of cognitive niche construction leads to a better understanding of the possibilities and limitations of enculturation.

I will illustrate the fecundity of the EPP framework by considering reading acquisition as a paradigm case of enculturation. Empirical evidence suggests that specific cortical areas become functionally differentiated and effectively connected so as to process visual word forms. Furthermore, eye tracking studies demonstrate the systematic efficiency gain of eye movements in the course of reading acquisition. On a personal level of description, reading acquisition can be assessed by a careful consideration of the specific cognitive norms (e.g., the norm of grapheme-

phoneme correspondence) that the individual needs to master in the course of scaffolded learning. In addition, I will argue that the specific properties of writing systems and the features of the cognitive niche (e.g., the ubiquitousness of written language) enable and constrain the entire process of reading acquisition. This example will illustrate that the EPP framework promises to have the conceptual tools, the empirical plausibility, and the epistemic scope to account for the malleability of the enculturated mind.

Rene Baston.
Implicit Attitudes and Implicit Prejudices – A Dispositional Account

In social psychology, the concept of implicit attitudes has given rise to ongoing discussions that are – according to the editors of the 'Handbook of Implicit Social Cognition' – rather philosophical. The aim of this paper is to discuss the status of implicit prejudices from a philosophical point of view. With implicit prejudices being special cases of implicit attitudes, the discussion will be framed by a short discussion of the most central aspects concerning implicit attitudes and indirect measures. In particular, the ontological conclusions that are implied by different conceptions of implicit attitudes will be scrutinized. The main question to be discussed involves whether implicit prejudices are mental states at all, or whether they are (despite the label 'implicit mental states') rather dispositions to behave in a certain way. This question will be discussed against the background of principles for belief (and mental state) ascription, which requires ascribed mental states to fulfill some specific explanatory role. In conclusion, I will defend a conception of implicit prejudices that does not assume them to be mental states on the grounds of more explanatory power.

Rodrigo Jesús Díaz Martín and **Hugo Viciana Asensio**. *The role of emotion in morality's in uence in non-moral judgments*

Recent research in experimental philosophy has shown that moral considerations can influence people's intuitions about non-moral concepts. In a seminal study, Knobe (2003) showed that most people consider that morally bad side-effects, but not morally good side-effects, are brought about intentionally. Similar asymmetries have been reported, not only regarding the concept of intentionality, but also causation (Hitchcock & Knobe, 2009), freedom (Phillips & Knobe, 2009) and the doing/allowing distinction (Cushman, Knobe, & Sinnott-Armstrong, 2008). But in spite of the wide range of studies reporting this type of effects, there is an ongoing debate concerning what are the specific psychological mechanisms at work. This debate is of philosophical relevance because the question here is whether the discussed asymmetries are rooted in our core understanding of the involved concepts, or they are caused by the influence of additional factors that distort our use of those concepts, and thus suppose a bias. If people's intuitions about the involved concepts include moral considerations, that would mean that philosophers' intuitions, which are assumed to be widely shared, are in fact out of step with those of the folk, and the analytical study of these concepts should be revised. If the effect is a bias, the non-naturalistic understanding of the concepts involved in the effect is not challenged.
A central topic in the debate is whether or not affective reactions play a role in the discussed phenomena. Some argue that the judgment asymmetry could be explained by a negative affective reaction to the scenarios involving morally bad actions, which distorts subsequent reasoning (Nadelhoffer, 2006). However, others claim that there is a lack of evidence in favour of that

hypothesis (Knobe, 2010). Specifically, the main evidence used against the affective bias hypothesis is the fact that population groups with severe emotional deficits such as psychopaths (Cardinale et al., 2014) and subjects with lesions in the ventromedial prefrontal cortex (Young, Cushman, Adolphs, Tranel, & Hauser, 2006) still show the judgment asymmetry. However, the emotional deficits of these population groups do not extend to all emotion categories, for example, angry responses are not impaired in these subjects. Furthermore, studies reporting correlations between the judgment asymmetry and individual differences in cognitive reflection (Pinillos, Smith, Nair, Marchetto, & Mun, 2011) and personality (Cokely & Feltz, 2009) suggest that the asymmetry is reduced under higher quality cognitive and epistemic conditions, providing indirect support for the affective bias hypothesis. However, an unexplored possibility until now involve employing methods commonly used in social psychology for inducing and measuring emotion (Quigley, Lindquist, & Barrett, 2013) to directly test the hypothesis. Here we present the results of a series of direct empirical tests of the affective bias hypothesis using these tools. We explore the effects of emotions on intuitions about concepts such as intentionality and causality in cases of varying moral status, and draw some lessons on the psychological explanation of the influence of moral considerations on intuitions about non-moral concepts and the philosophical relevance of these effects.

Sabrina Coninx.

The Phenomenology of Pain: The Issue of Necessity and Sufficiency

In my PhD project, I want to argue for the claim that pain is constituted by a complex pattern of stereotypical components whereas none of them proves necessary and/or sufficient for someone to be in pain. In the scope of my planned presentation, I will outline one aspect of this overall purpose by rejecting the assumption that pain can be defined exclusively in terms of a certain kind of sensation. The account in question, famously presented by Saul Kripke (1981) and Colin McGinn (1996), equates pain with its phenomenal character, i.e. the feeling of what it is like for a subject to undergo a pain episode. Accordingly, a mental state is a pain state, if and only if it feels in the required way, while the presence or absence of any other feature becomes irrelevant. Simply put: 'To be in pain' means 'to feel pain' and vice versa.

The decisive issue for such an account lies in the fact that its advocates now need to specify the concrete phenomenal property that shall be both essential and exhaustive for pain. The following three candidates are traditionally brought to the fore:

(a) Sensory-Discriminative Dimension, i.e. the feeling of location, intensity, duration, and type-specific quality (e.g. burning, sharpness, piercing);

(b) Affective Dimension, i.e. the feeling of unpleasantness;

(c) Modality Affiliation, i.e. the feeling that a variety of sensory-discriminative features constitute determinants of the distinct modality 'pain'.

Imagine for instance you got hit against the funny bone. The upcoming sensation feels like a brief but intense and shooting electro-shock in the elbow (a) while those sensory properties are experienced as carrying the mark of the modality 'pain' (c). At the same time, the subject undergoes a negative affection adding the property of unpleasantness to the phenomenal content (b).

In my presentation, I will analyze these potential candidates for the defining phenomenal property of pain. By referring primarily to empirical investigations of psychologists and clinical physicians,

I will reveal that those accounts, although intuitively plausible, cannot be formulated in a conclusive manner. Each of the three alternatives suffers from explanatory shortcomings once it is regarded as the unique feeling that all and only pain episodes possess. First, no feature seems to be necessary since it is always possible that the chosen property is not present although the subject is in pain. Second, none of the three phenomenal traits is by itself sufficient to distinguish pain from other phenomenally similar sensations; neither can it capture the complex structure of pain. Consequently, theories that equate pain with one specific phenomenal aspect are at best unsupported. There must be more to pain than a simple sensation.

Sarah Beck, Lily Fitzgibbon, Ian Apperly, Suzanne Higgs and Jane Raymond.
Types of regret across the lifespan

Regret is a commonly felt emotion, arising from counterfactual thinking about how one's actions may have turned out differently. Recent psychological work has addressed the question of when children begin to experience regret, which brain mechanisms are implicated, and to some extent regret in older age. However, as is the case for many psychological processes, regretful thinking in middle adulthood is typically regarded as stable, despite the likelihood that changes in cognitive processes and life experiences will exert influence.

In this study we tested a sample from the general population aged between 18 and 89 (mean age 39.7) using a mobile app. Participants signed up to complete a series of tests and games exploring learning, social cognition, health, and regret. To date 175 participants have completed regret tasks and preliminary data analysis is reported.

Participants completed four different measures of regret: a gambling task in which they reported how they felt after discovering an alternative gamble would have resulted in a better outcome (based on Camille et al., 2004); a risky decision making task which gave a measure of how participants changed their behaviour after large and small missed opportunities (Buchel et al, 2011), the Counterfactual Inference Task in which participants read a short vignette and were asked to describe which of two characters is likely to feel worse (Hooker et al, 2000), and a regretful thinking questionnaire in which participants reflected on their own style of decision making (Schwartz et al., 2002).

There were two broad questions to be addressed: First, how would regret change over the lifespan? Second, how would these different measures of regret relate to each other? Neither reported emotions on the gambling task nor behaviour on the risky decision making task were predicted by participants' age. In contrast, older participants were less likely to use counterfactual thinking to answer the Counterfactual Inference Task ($r = .190$, $n = 175$, $p = .012$) and older participants reported less regret in the reflective regret questionnaire ($r = -.444$, $n = 108$, $p < .001$). There were no relations between regret measurements taken from the four tasks.

Our preliminary data suggest that how people reflect on their own experience of regret and predict other people's regret may change over middle age with older adults being less influenced by regret. Yet, online decision making measures do not reveal age-related change. Perhaps most importantly, the lack of relations between our measures of regret suggests that there is much to be done in terms of defining this emotion psychologically and understanding its different aspects.

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Silvia Ivani.

What We (Should) Talk About When We Talk About Fruitfulness

What are the relevant values to assess a scientific theory? This question remains hotly debated. Thomas Kuhn (1977) suggested a list of five desirable values that scientists should consider when assessing scientific theories. That list included accuracy, consistency, scope, simplicity, and fruitfulness. Since then, several philosophers have proposed many lists and analysed these values (McMullin 1982, Douglas 2009). Surprisingly, despite being included in several lists, little attention has been paid to fruitfulness. To date, philosophers have not exhaustively explained and justified its inclusion in the lists of values. Granted, it is taken as a fundamental desideratum and, intuitively, it seems one of the crucial features of scientific theories. However, in order to avoid 'empty shells' among cognitive values, philosophers should provide a clear definition of fruitfulness by answering two key questions: what is fruitfulness? What is its role in the assessment of scientific theories? In this paper, I try to fill these gaps by suggesting an analysis of the meaning and roles of this value. To do so, I propose a specific case study, i.e., I analyse Evolutionary Psychology (Buller 2005) by using a new interpretation of fruitfulness. This case study shows how this approach improves the understanding and assessment of fruitfulness of research programs and theories.

I argue that the traditional accounts of fruitfulness are vague and unsuitable. Despite offering interesting insights, they mistakenly characterize fruitfulness by focusing on the quantity of hypotheses and predictions produced by a theory. These accounts fail to distinguish between fruitful and 'creative' theories. That is, they characterize a creative theory producing many ad hoc hypotheses and unreliable explanations as fruitful. Although it satisfies fruitfulness, such a theory does not seem valuable. I argue that a suitable account of fruitfulness should focus on the quality of predictions and hypotheses. In other words, fruitful theories should provide a satisfactory amount of reliable explanations. Furthermore, I claim that we should think fruitfulness as the power to improve and not as the mere ability to enlarge the content of a scientific theory.

In this paper, I use Evolutionary Psychology to show the benefits of this account of fruitfulness. For this analysis, two aspects are especially important. First, we have to analyse the methods and approaches used to formulate new predictions and hypotheses. In my analysis of Evolutionary Psychology, I focus on reverse-engineering and adaptive thinking. Second, we have to evaluate the tests employed to validate predictions and hypotheses. Here, I consider some of the tests used by evolutionary psychologists, such as the tests employed in cross-cultural studies and comparative analysis.

The account of fruitfulness defended in this paper permit us to pinpoint many interesting and relevant aspects of Evolutionary Psychology that are not detectable with a traditional interpretation of fruitfulness. Hence, I argue that this new characterization both improves the philosophical analysis of fruitfulness and the scientific evaluation of the merits of research programs and scientific theories.

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Sonja Jördis Ebel, **Martin Schmelz**, **Esther Herrmann** and **Josep Call**.
Do chimpanzees anticipate the outcome of their actions?

Being able to anticipate outcomes following one's actions is a crucial component of flexible problem solving. The floating peanut task (FPT) requires subjects to pour water inside a clear tube to bring a peanut from the bottom to the top of the tube. Although chimpanzees (Pan troglodytes) can spontaneously solve this task, it is unknown whether they anticipate that the peanut will float upwards by spitting water into the tube or if they repeat the action after obtaining positive visual feedback. We presented naïve chimpanzees (N = 24) with an opaque version of the FPT but none of the chimpanzees solved it spontaneously. However, one chimpanzee solved the task after an end-state demonstration and two others spat water into the tube, but failed to obtain the peanut. We know from a previous study that chimpanzees can successfully solve the FPT when the tube is opaque after they have solved the FPT with a clear tube. Thus, chimpanzees can solve the FPT without obtaining positive visual feedback, but only if they have solved the task with a clear tube before or, as in the current study, they have been presented with an end-state condition. Interestingly, none of our chimpanzees spontaneously spat water into the opaque tube in the baseline. This means that the lack of positive visual feedback of the peanut rising did not cause them to fail, but rather they failed because they did not spat water into the tube in the first place. Thus, visibility of the reward might be crucial for chimpanzees to come up with suitable solutions. It might be that chimpanzees then evaluate their actions with the visual feedback they get, but we cannot exclude that they may also anticipate the outcome of their actions. Our findings fit well to recent research showing that visual feedback plays an important role in nonhuman great ape problem-solving.

Szabolcs Kiss and **Anna Soós**.
Recognition of Moore-paradoxical sentences in children.

The present paper reports an experiment on recognition of Moore-paradoxical sentences in preschool and school-aged children. What is Moore's paradox? It was Wittgenstein who named this paradox because Moore called our attention to the following anomaly: It is paradoxical to assert that It is raining, but I do not believe that it is raining. Today a lot of philosophers (e.g.

Sorensen, Rosenthal, Shoemaker, Williams etc.) deal with this paradox and they developed different resolutions of it. In fact, Green and Williams (2007) enumerate 18 philosophical theories that can explain the paradox. In the present experimental study we are committed to the view advocated by John Searle according to which the paradox arises because when we assert that p then we also express a belief that p. So it is paradoxical to say that p and not believing that p at the same time. In other words, when we are making assertions we also express a corresponding mental state. In the framework of this interpretation we developed our experimental material that is to say we created 25 target paradoxical sentences and two for the warm up trial. All of the experimental sentences were paradoxical in the way that they formulated a kind of contradiction between the first part and the second part of the sentences. In other words, the second part of the Moorean sentences expressed a mental state that was incompatible with the first part of the sentence. For instance, we used inter alia the following sentences: The sun is shining, but I do not believe that it is shining. I promise that I'll give you a bike for your birthday, but I do not want to buy you a bike. Etc. That is to say, we do not confine ourselves to Moorean assertions but we also used other utterances or speech acts in the same spirit. So the principle of creating the experimental sentences was that the connection between the two parts of the sentences is a kind of anomaly or contradiction.

Our research questions are the following: When and how do children recognise the paradoxical nature of Moorean sentences? What is the relationship between the developing theories of mind and this recognition? Is understanding of pure logical inconsistency a prerequisite for comprehending the paradox?

Participants were 25 five-year-olds, 23 six-year-olds, 23 seven-year-olds and 25 eight-year-olds.

During the experiment, children had two choose between two speakers the one who said something silly. So, one of the speakers always expressed a paradoxical statement while the other one said a syntactically matched control and non-paradoxical sentence.

According to our experimental findings, 5-and 6-year-old children are bad at this task while the overwhelming majority of seven-and eight-year-olds could select the Moore-paradoxical sentences from our stimulus material. In other words, there is a clear developmental pattern in the age range studied in this experiment. These findings show that there are interesting developments in theory of mind reasoning after six years of age in the elementary school period.

Tyler Brooke Wilson.

Dimensions of Color Appearance

MDS techniques offer us insights into the number of axes of differentiation along which mental qualities can be discriminated. Classical MDS studies of color vision have reinforced a three dimensions understanding of color appearance. Against this traditional model, Tokunaga & Logveninko defend the "two triplets thesis;" that color appearance is six dimensional — constituted by three material and three lighting color dimensions. Performing an MDS study under variegated illumination, Tokunaga and Logveninko offer strong evidence for a fourth dimension of color appearance, which they take to be a dimension of 'lighting hue.' If true, such a finding supports the two triplets thesis.

It is argued in this paper that Tokunaga and Logveninko's results are equivocal between lighting hue and simultaneous color contrast interpretations. Furthermore, two key results of Tokunaga and Logveninko's study, namely the failure of their paradigm to produce an achromatic gray point and

the inability to create a match between colors under opponent lighting, support a simultaneous color contrast interpretation at the expense of the two triplets hypothesis. Finally, one further, theoretical concern is brought to bear on the discussion. That is, insofar as the material and lighting dimensions proposed by the two triplets thesis aim at vertical perception of surface reflectance and illuminant properties, the triplets thesis is committed to the existence of computational and physiological mechanisms by which these properties can be gleaned from a confounded retinal signal (see figure 2). Despite extensive work on this problem unequivocal evidence of such mechanism has yet to be found. A few empirical suggestions for further research, aimed at disambiguating the nature of Tokunaga and Logveninko's novel dimension of color appearance, are offered in the final section of this paper. Such research may well offer us further insights into the structure of mental visual qualities and the nature of perceptual representation more generally.