Volume of Abstracts

Workshop organized by
DiaRaFor Project, MSH de Lorraine (USR 3261)
Archives H. Poincaré (UMR 7117 CNRS Nancy)
Nancy University

Contents

The workshop will take place at the building of the

Lorraine Institute for Social Sciences and Humanities
(Maison des Sciences de l'Homme (MSH) de Lorraine)
91 avenue de la Libération
BP 454. F-54001 NANCY Cedex
International Room (3rd floor, No 324)

Presentation

EpiConFor. Epistemology, Context, Formalism

The purpose of the workshop is to tighten and strengthen the connections between current researches bearing on the following three pairs of topics:

- *Context and Epistemology.* In the last decades epistemology has seen a major "linguistic turn", through the increased reliance, in contemporary debates, on syntactic, semantic and pragmatic "evidence" about ordinary (uses of) linguistic constructions in terms of "know", most notably as a result of the flourishing discussions over the epistemological relevance of various notions of context (of inquiry, of attribution, of assessment, etc.).

- *Epistemology and Logic.* In addition to its "linguistic turn" epistemology has also seen a "logical turn", through the recently revived and rising conviction that discussions in mainstream epistemology may benefit from formal epistemology (epistemic logic, formal learning theory, belief revision, and so on) which, however, has had close to nothing to say about context (modulo a few exceptions).

- *Logic and Context.* While well-known approaches to context can be found in natural language semantics and pragmatics, the only logics of context properly speaking are to be found in theoretical computer science where, however, the main logical treatments of context owe nothing or so to philosophy (again, modulo a few exceptions).

The workshop is thus intended as an occasion to bring together researchers working on either one of the above intersections, or at the intersection of the three topics.

Although all the papers presented on that occasion are expected to bear importantly on properly philosophical issues, as part of the MSH Lorraine-based DiaRaFor research project, special emphasis shall be put on specific formal epistemological accounts. The workshop will set the stage for a projected volume of collected papers dedicated to the topic(s).

Programme Committee

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1 Brad Armendt
Pragmatic Interests and the Strength of Belief

Whether knowledge that p, or justification for believing that p, is present or absent on a given occasion, or is judged to be present or absent, depends in part on context. The influence of context on standards for knowledge and justification, or on standards for judging knowledge and justification, has been widely explored and debated in contemporary epistemology. This paper does not directly take up that discussion, however; its subject is the extent to which context influences the presence or absence, or more generally the strength, of belief.

I consider contextual elements of a particular kind, namely those that contribute to the believer's expectations about the practical significance of p's being true. What difference does what the believer takes to be at stake on p's truth make to the strength of his belief about p?

The pragmatic interests being considered here are attached to the truth or falsehood of a belief. A different and well-discussed idea is that what is at stake on the having of a belief may influence whether it is believed, or how strongly it is. There are many examples; a classic one is Pascal's wager. But that is a different idea. The question raised here is whether belief that p is sensitive to what is at stake on p's truth, rather than on the believing of it.

The main question being raised here concerns the sensitivity of synchronic belief to what is at stake. So picture a believer at a particular time, holding a particular set of beliefs in a context that includes his expectations about what is at stake on their truth. Are the beliefs sensitive to, partly determined by, those expectations? What would they be if the stakes changed? Perhaps they would be altered. If so, does the change arise from a direct dependence of the belief on a contextual parameter (i.e. a sensitivity of synchronic belief), or does it arise from a learning experience about the new stakes (a diachronic influence inducing belief change)? As an empirical matter about a particular occasion, this would be difficult to find out. But more theoretically, the first alternative raises the idea that synchronic belief states in unspecified contexts should be modeled as indeterminate mixed states, resolvable into more definite doxastic commitments when the value of a parameter representing what is at stake is supplied.

At least one well-known precise formal model of belief, the account of degrees of belief underlying standard subjective probability, is explicit in its assumption that degrees of belief are insensitive to the size of the stakes. However, other accounts (likely better known in other fields than they are in mainstream philosophy) attend to the availability of belief and take seriously the idea that belief is sensitive to what is at stake. One will be raised in the talk (Thomason 1986, 2007) and I hope for discussion of it and others during the workshop.

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2 Peter Baumann
A Contradiction for Contextualism?

One of the most serious problems for epistemic contextualism has been very much neglected so far:[1] Can contextualists about "knowledge" explain the possibility of knowledge attributions across contexts? It seems that the attempt to do so leads into inconsistency.

Here is the problem. Suppose there are two ascribers O and S; O finds himself in an ordinary and not-so-demanding context C-O; S finds himself in a more demanding, (but not sceptical) context C-S. The contextualist says that the following is possible: O's utterance of "S knows that he has hands" is true, and S's utterance of the same sentence is false whereas S's utterance of "S doesn't know that he has hands" is true and O's utterance of it is false. The contextualist explanation is that because of the context-sensitivity of "know" these two utterances do not express the same proposition or do not have the same meaning: the truth conditions as well as the truth of knowledge ascriptions varies with contexts of attribution; different utterances of the same sentence might mean different things in different contexts (cf. Cohen 1987; DeRose 1992; Lewis 1996; Sosa 1988).

Let us assume that the contextualist (S) finds himself in a more demanding context, say, C-S. According to contextualism, the following is true:

(1) O's utterance of "O knows that S has hands" is true in context C-O

whereas

(2) S's utterance of "S knows that he has hands" is not true in context C-S.

Suppose (1) and (2) are true and the contextualist even knows this in his more demanding context (which should be possible according to contextualism). Then the following also hold, according to the contextualist:

(3) S's utterance of "S knows that (1)" is true in context C-S.

Now, whenever an utterance of a sentence of the form "A knows that p" (in some context) is true, it seems unavoidable to accept that p:

(DF) "A knows that p" (as uttered in some context) is true $\Rightarrow p$.

If we apply (DF) to (1) we get

(4) O's utterance of "O knows that S has hands" is true in context C-O $\Rightarrow$ S has hands.

It is certainly possible for the contextualist to know this (in his more demanding context). Hence, we may assume that

(5) S's utterance of "S knows that (4)" is true in context C-S.

Finally, there is a very plausible closure principle:

(Clos) For all contexts C, speakers A and propositions p, q: ["A knows that p" (as uttered in C) is true and "A knows that $(p \Rightarrow q)$" (as uttered in C) is true] $\Rightarrow$ "A knows that q" (as uttered in C) is true.

[1] Elke Brendel's 2003 (see also 2005) and Crispin Wright's (2005) recent papers are exceptions; see also short passages in Veber 2004, 268-269, Brueckner 2004, Engel 2005, 58, 63, Kompa 2005, 18-19, 25-26, Kallestrup 2005, Steup 2005, sec.1-2, 6; see also Baumann 2008.

From (Clos) together with (3) and (5) follows:

(6) S's utterance of "S knows that he has hands" is true in context C-S.

However, (6) contradicts

(2) S's utterance of "S knows that he has hands" is not true in context C-S.

But (2) is part of the contextualist position. In other words, from contextualism ((1)-(3)), disquotation and factivity ((DF) – which leads to (4) and (5)) and closure ((Clos)) we can derive a contradiction. If one builds disquotation, factivity and closure into the contextualist position – as many contextualists would want to do – then contextualism turns out to be inconsistent and should thus be given up. If one rejects them and doesn't build them into contextualism, then contextualism turns out to be incompatible with very plausible epistemic principles and should therefore be given up. Whatever one's view here - it seems that one has to give up contextualism. Given closure (and disquotation), factivity is the killer; given factivity, it is closure (leaving disquotation aside). For want of a better name we can call this problem the "factivity problem".[2]

I think there is a way out for the contextualist. It will turn out that a special form of contextualism, relationalism, has a plausible answer to the problem. We will also have to modify the principle of closure a bit (but not too much). These measures are reasonable for independent reasons, given contextualism. And they keep contextualism safe from the threat of inconsistency.

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[2] This ought not to be misunderstood as indicating that the problem for contextualism is exclusively with the factivity principle. Analogous problems arise for subject-sensitive invariantism (cf., e.g., Hawthorne 2004 and Wright 2005). The solutions I propose for contextualism won't work for that form of invariantism.

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3 Johan van Benthem
Logic, Mathematics, and General Agency

If logic is the general study of a priori valid reasoning, then where is the paradigmatic area where we see this reasoning in its full glory? To some, this is mathematics, where precision is relentless, and strings of inferences are taken to impressive lengths. But on another view, the highest form of reasoning is displayed in the ordinary world of common sense – say, when engaging in conversation about something that matters. In that interactive setting, pure information is deeply intertwined with evaluation and goals, and we achieve admirably subtle balances between these different streams. In this lecture, I confront modern dynamic logics of agency with classical mathematical practice, seeing which lessons can be learnt, either way.

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4 Roger Clarke
Contextualizing Degrees of Belief

This talk will argue for the benefits of adopting a certain view about belief, claiming that it allows novel solutions to two problems: reconciling degreed and binary notions of belief, and the preface problem.

The view in question has two main commitments: first, that degrees of belief change from context to context, depending on what possibilities the believer is taking seriously in a given context; second, that beliefs in the binary sense (i.e., "full" beliefs) are similarly context-sensitive, because to believe in the binary sense is to have belief to the highest degree (degree 1, on a probabilistic formalization). More precisely, the view is that agents have (or can be represented as having) a prior credence function, which determines their degrees of belief in a context by conditioning on the disjunction of all possibilities the agent takes seriously in that context. The view is lent some plausibility by the sorts of cases appealed to in the literature on epistemic contextualism and invariantism, but I will only give a cursory treatment of this connection.

Now that we have a sketch of the view, let us see what use can be made of it. First, and most significantly, there is the problem of reconciling divergent notions of belief. There is the binary, all-or-nothing notion, and the degreed (usually probabilistic, or at least numerical) notion. Both are valuable ways of thinking and talking about belief-for example, the degreed notion, but not the binary, is essential to decision theory; the binary notion, but not the degreed, governs norms of assertion (cf. Moore's paradox)-but they have proved resistant to integration. This is largely because the natural move towards integration takes a threshold view, according to which binary belief is belief to a degree above some threshold, usually lower than 1. But without the context sensitivity my thesis builds into both degrees of belief and binary beliefs, the threshold view leads to paradoxes, if not outright counterexamples. Cautious Charlotte knows the probability of her ticket losing the lottery is very high, and her degree of belief that her ticket will win matches that probability; but she does not have a binary belief that her ticket will lose. On a contextually insensitive threshold view, Cautious Charlotte is impossible, because to believe in the binary sense just is to have high enough degree of belief. Of course, Cautious Charlotte is only a problem for the threshold view if the threshold for belief is, as I said above, lower than 1. But setting the threshold for belief at 1 without including context sensitivity is no help: for believing p to degree 1, according to most accounts of degrees of belief, means being willing to act as though p were true in any situation, to bet on p at any odds. If this is what binary belief requires, most of us never have any non-tautological binary beliefs. For example, I would not stake my life against a penny on a bet that Sarkozy is the President of France-but, intuitively, I would count this among my beliefs.

The context sensitivity of my thesis avoids these problem cases, while preserving the intuitive appeal of the threshold view. According to my thesis, we have a binary belief that p if we believe p to degree 1 in a particular context. This does not have implausible consequences for my belief about Sarkozy because being offered a bet at extremely long odds and with extremely high stakes is one way of altering the context of belief. That is, if I have to worry about losing my life, I will think carefully, and take seriously possibilities I otherwise might not (has there been a very recent abdication?). Tests of very high degree of belief involve extraordinary circumstances; that ordinary people would not accept extraordinary bets does not tell us anything about their degrees of belief in ordinary circumstances.

Second, despite setting the threshold for binary belief at 1, my thesis allows a treatment of the preface paradox on which an author can coherently believe all the claims she makes in a book, and believe that at least one of them must be mistaken. The familiar way of reaching this conclusion is to set the threshold for binary belief below 1; if several beliefs are believed

to a degree just above $x < 1$, then their conjunction will be believed to a degree below x if the believer is probabilistically coherent. If we interpret the disclaimer in the author's preface as disavowing belief in the conjunction of all the claims in the body of the text, we reach the desired conclusion. On my context-sensitive view of belief, we can still get this result, because the preface is written in a different context from the individual claims in the body of the text. Taking a view of the work as a whole, the author will naturally take more possibilities of error-and more types of possibility of error-seriously than she would in evaluating any single claim. Furthermore, on my account but not on the sub-unity threshold account, the author need not have contradictory beliefs. This lends support to views on which rational belief is closed under deductive implication.

Here is a brief plan of the talk: introduction and statement of the view (5 minutes); connections with the epistemic contextualism/invariantism debate (5 minutes); the problem of reconciling binary and degreed notions of belief (10-15 minutes); the preface paradox (5-10 minutes).

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5 Dylan Dodd
Knowledge and belief: eliminating the possibilities

The following thesis has been defended by contextualists about knowledge attributions like David Lewis (1996), and contrastivists such as Jonathan Schaffer (2004), (forthcoming-a), (forthcoming-b):

(∗) S knows p only if S can eliminate all the not-p possibilities.

I give some reasons for accepting (∗). Contextualists like Lewis and Schaffer stop at knowledge. I argue that the reasons I give for accepting (∗) extend to the following similar principle about belief:

(†) If S believes p, S regards herself as having eliminated all the not-p possibilities.

Let me explain.

I think the following arguments are valid (Argument 1 comes from Yalcin (unpublished)):

Argument 1	**Argument 2**	**Argument 3**
If p then q	p or q	p or q
Probably p	Possibly $\neg p$	Probably $\neg p$
Probably q	Possibly q	Probably q

They're valid if interpreted in the right way. Consider Argument 2. It's *in*valid in standard modal logic. However, say I claim that Smith definitely didn't murder Jones. Holmes counters that the murderer was either Williams or Smith. I agree. He then convinces me that it might not have been Williams. Conclusion: I was wrong – Smith might be the murderer after all. This is a good bit of reasoning. Now consider Argument 1. Say you convince me that if Obama wins Florida he'll win the election, and that he'll probably win Florida. What should I conclude? That he'll probably win the election.

I show that Arguments 1-3 are only valid if we take the first premises as true in all possible worlds, if they're true at all. But in the examples I just gave of arguments that seem valid, and are of the form of Arguments 1 and 2, the first premises were *contingent*, not necessary truths. So how can we account for the validity of the arguments? As follows. In regarding the first premise as true, you rule out all the possibilities in which it doesn't hold. I show how, if we assume that this is what it means to regard the first premise as true, explaining the validity of the arguments is straightforward.

The explanation of the validity of Arguments 1-3 supports (∗) and (†). Assuming epistemic closure (roughly: If S knows p and knows q and is capable of competently deducing r from p, q, then S is in a position to know r), if S knows the premises of these arguments, she should in principle be in a position to know their conclusions. I argue that if this is true, given the above explanation of the arguments' validity, then in knowing their first premises, S is able to rule out all possibilities in which the first premises aren't true. This is exactly what we would expect if (∗) were true. Furthermore, I claim that in *believing* both premises of the arguments, one is committed to their conclusions. In order to explain how this could be, I argue we need to claim that in believing one of the argument's first premises, one regards oneself as having eliminated the possibility that the premise is false. This is exactly what we would expect if (†) were true.

In response, someone who rejected (∗) and (†) could say that, although generally knowing p doesn't require being able to rule out the possibility that not-p, for some reason believing the first premise in these arguments, and then employing this belief in reasoning through the arguments, does require this. The problem with this response with respect to (∗) is given by a

point made by Lewis (1996). An assertion of 'I know p, but can't rule out the possibility that not-p' is infelicitous, suggesting that in general we regard knowing p as being incompatible with regarding a not-p possibility as not ruled out. The fact that $(*)$ explains in one fell swoop why such knowledge attributions are infelicitous, and why knowing the premises of Arguments 1-3 puts one in a position to know their conclusions provides powerful evidence for the truth of $(*)$.

Similarly for $(\dagger)$. Sentences of the form 'p but possibly not-p' are also infelicitous, and the propositions they express aren't propositions one can regard as true (Yalcin (2007)). This fact suggests that believing p is incompatible with regarding not-p as possible *in general*, not just in the context of Arguments 1-3. The fact that $(\dagger)$ can provide a simple unified explanation *both* of why we can't regard propositions of the form p *and possibly not-p* as true, *and* why someone who believes the premises of Arguments 1-3 is committed to their conclusions, gives us a good reason to accept $(\dagger)$.

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6 Julien Dutant
Methods-based models for knowledge

We introduce a new formal representation of knowledge, based on the idea that knowledge is a matter of forming a belief through a (sufficiently) error-free method. We rely on the notion of "method" as belief-forming process, common in the epistemology literature [6, 1]. The resulting models are an extension of Scott-Montague neighbourhood models [7, 4, 5]; we argue that they are as powerful but more versatile that normal models commonly used in epistemic logic [2].

An agent is modelled by a set of methods, that is functions from worlds to sets of propositions (non-inferential conclusions) and from sets of propositions (premises) to propositions (conclusions) out of which "neighbourhood" functions can be built. In particular, for any agent, B^m_w is the set of propositions that are believed out of method m at w.

A method is infallible if it could not have supported false beliefs. To state this, we introduce a background *alethic* modality (accessibility relation $\sim$ and corresponding operator "$\Box$"). A method m is infallible at w iff its outputs at accessible worlds are true: for any proposition p and world w' s.th. $w \sim w'$: $p \in B^m_{w'} \rightarrow w \in p$. Knowledge is belief based on an infallible method:

Knowledge $p \in K^m_w$ iff $p \in B^m_w$ and $\forall p', w'((w \sim w' \wedge p' \in B^m_{w'}) \rightarrow p' \in w')$.

We point out possible refinements without exploring them in details. (1) The accessibility relation can be restricted or relativized to contexts of attribution to represent safety [8] and contextualist [3] approaches respectively. (2) A probabilistic account can be stated by replacing infallibility with a suitable probability measure. (3) Because we represent propositions by sets of worlds, we cannot represent *referential opacity* phenomena: if p and q are necessary equivalents, an agent (implausibly) knows that p iff she knows that q. We sketch one way in which the issue could be dealt with.

In general, our models validate only two principles:

Factivity ($\mathbf{T}_M$) $Kp \rightarrow p$

Subjectivity $Kp \rightarrow Bp$

They do not validate *logical omniscience* : agents can ignore the logical consequences of what they know. These are, in our view, welcome results.

Our models get their power when we define *complex* methods built out of simple ones. For instance, we introduce the **Deduction** method as follows:

Deduction Let m^D be such that for any world w, proposition p and set of propositions (premises) π : $p \in m^D_w(\pi)$ iff $\exists q, r \in \pi(q \cap r \subseteq p)$.

And we introduce a principle of *method composition* :

Composition The composed method $m \circ m'$ is the function s.th. for any proposition p, world w and sets of propositions π, $p \in m \circ m'(\pi)$ iff $p \in m(m'(\pi))$.

This implies that whenever p is a logical consequence of q and r and the agent believes q and r out of a method m, she believes p out of the composed method $m^D \circ m$. **Deduction** can be shown to preserve infallibility: if m is infallible, $m^D \circ m$ is. Consequently, an agent possessing the **Deduction** method (a "perfect reasoner") knows all the logical consequences of what she knows.

A full-blown **S5** epistemic logic can be derived from a series of natural idealizations: perfect reasoning (as above), perfect psychological introspection (roughly, $Bp \rightarrow BBp$ and $\neg Bp \rightarrow$

$B\neg Bp$), perfect confidence (roughly, $BBp \rightarrow BKp$ and $B\neg Bp \rightarrow B\neg Kp$) and epistemic excellence (all of the agent's methods are infallible). We show that, in addition to $(\mathbf{T}_M)$ and **Subjectivity**:

$(\mathbf{K}_M)$ $K(p \rightarrow q) \rightarrow (Kp \rightarrow Kq)$

is satisfied by perfect reasoners.

Perfect Self-knowledge $Bp \equiv KBp$ and $\neg Bp \equiv K\neg Bp$.

is satisfied by perfect introspecters.

(4_M) **Perfect knowledge of one's knowledge** $Kp \rightarrow KKp$

Partial Knowledge of one's ignorance $\neg B\phi \rightarrow (\neg K\phi \rightarrow K\neg K\phi)$.

are satisfied by perfectly confident perfect introspecters.

Belief is knowledge $Bp \equiv Kp$.

is satisfied by excellent agents.

(5_M) **Perfect knowledge of one's ignorance** $\neg K\phi \rightarrow K\neg K\phi$.

is satisfied by excellent agents who are perfectly confident perfect introspecters.

We conclude that the idealizations at work in standard models are *heterogenous*: while introspection and confidence can be seen as matters of "internal" rationality, the idealization behind **(5)** is a matter of excellence of the agent. This gives a more philosophically satisfying picture of why and when axioms of standard epistemic logic hold or fail.

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7 John Hawthorne
Contextualism revisited

No abstract

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8 Vincent F. Hendricks
General Dynamics: Agents and Agendas

Already in *Knowledge and Belief – An Introduction to the Logic of the Two Notions* from 1962, Hintikka considered whether a knowledge transmissibility axiom like $K_\delta K_\gamma \varphi \rightarrow K_\delta \varphi$ held for his first version of epistemic logic. As an iterated version of Axiom **T** the axiom trivially holds as long as agents δ, γ index the same possible worlds. From a knowledge acquisition or learning theoretic perspective the axiom is far from trivial as the validity of the axiom is acutely sensitive to what the inquiring agents decide to do. Thus, this first knowledge transmissibility axiom addresses the general dynamics in contemporary formal epistemology – in particular the interplay between agents and their knowledge acquisition agendas.

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9 Hans Kamp
Referring and Describing: The Referential-Attributive Distinction from a twenty first Century Perspective

The referential-attributive distinction is as much of a challenge today as it was when Donnellan introduced it in the sixties. Part of the challenge is to come to grips with the question exactly what this distinction is, and what kind of distinction it is. (A point already addressed in Kripke's "Speaker's Reference and Semantic Reference") In this paper I look at the distinction from a communication-theoretic perspective. The formal background is provided by a framework which emerged from an attempt to develop an account of linguistically relevant context that unifies the notion of utterance context found in the work of Kaplan and others with that of discourse context as it is used in Dynamic Semantics and Discourse Representation Theory. This effort led to a new comprehensive notion of context which not only incorporates utterance context and discourse context but includes other components as well. An important feature of the framework, which renders it useful for the specific purposes of this paper, is that it makes it possible to speak in formally precise terms about the choice of linguistic expressions made by speakers and about their interpretation on the part of hearers as distinct (if typically coordinated) processes.

The paper consists of three parts. The first describes what I take the challenges connected with the referential-attributive distinction to be. The second explains as much of the background framework as is needed for what I will have to say about these challenges in the third part.

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10 Erich Rast
Contexts as Assumptions

In the tradition of Stalnaker (1978, 2002), context can be regarded as a set of assumptions that are mutually shared by a group of epistemic agents. An obvious generalization of this view is to explicitly represent each agent's assumptions in a given situation and update them accordingly when new information is accepted. In this talk, I will lay out a number of philosophical and linguistic requirements for using such a model in order to describe communication of ideally-rational agents. In particular, I will address the following questions:

1. What is the logical status of assumptions as opposed to rational KD45 belief, how are these assumptions generated from an underlying belief base in a given interpretation situation, and how are assumptions revised/contracted?

2. What kind of ideal reasoning processes underly the interpretation of 'incomplete' content that may for example be obtained by an agent from an utterance by deriving some literal meaning from the lexicon and a grammar?

Regarding the first set of questions, my proposal is to consider assumptions akin to rational belief, but not stronger than modal logic KD, since positive and negative introspection do not seem to hold for them. Given that, an obvious question is what the relation between beliefs and assumptions is. One possible answer is to generate an agent's assumptions from an agent's beliefs in a given interpretation situation by revising his beliefs with his beliefs about what the message sender believes in that situation. If such an account is based on AGM belief revision/contraction (Alchourrón 1985, Gärdenfors 1989) there is a number of well-known problems that need to be addressed, because revision of iterated belief modalities is required in this case. These problems have already been investigated in detail in recent works on DDL (Leitgeb/Segerberg 2007) and DEL (see e.g. Ditmarsch et. al. 2008). Another strategy would be to maintain and revise assumptions independently of the beliefs of an agent. I will briefly discuss the advantages and disadvantages of each of these views. In both views, assumptions constitute the subjective context in which an agent interprets an utterance and encounters the world. The result of an interpretation is in turn checked against the agent's original beliefs, and if the checking operation succeeds the agent revises his beliefs by the result in the normal way described by the AGM paradigm.

The second of the above questions needs to be addressed on the basis of concrete examples. Considering utterance like 'David is ready' or 'John is tall' that from a contextualist viewpoint express semantically incomplete content in the sense of Bach (2005, 2007), how may an agent arrive at interpretations of these utterances that are more complete? A first step is to presume that missing semantic ingredients are represented by missing argument places, which is a problematic assumption as it introduces a dependence on the semantic representation language. Given that, a default interpretation can be obtained by existentially quantifying over the missing argument and interpretation can then be regarded as an inference process. In case of the two examples mentioned, the assumptions of the agent allow him to obtain more specific readings by instantiating a value for the existentially bound variable. As I will show, this inference can be relatively straightforward in some cases like 'John is tall', whereas it requires complicated encyclopedic background knowledge and a number of default reasoning steps in other cases.

Based on more examples of this kind, I will argue for the following requirements for an inferential theory of interpretation in communication: First, belief revision with iterated modalities in a multi-agent setting is needed to generate an agent's assumptions as laid out above. Second, default reasoning is needed. Third, a qualitative or quantitative representation of uncertainty

('degrees of belief') is needed in order to obtain a useful model of the checking step, since fortunately not everybody believes everything that other people say. These requirements put the theory of interpretation based on assumptions in the frontline of ongoing research on the implementation of belief revision and update in dynamic logics.

Such a theory might also be useful for contextualist accounts of strong knowledge, as it can be argued convincingly that when a knowledge ascription appears to be context-sensitive, this is so because the embedded proposition is context-sensitive and not because knowledge itself is context-sensitive. Hence, the context-sensitivity of embedded propositions in knowledge claims and how different agents in the same situation arrive at different assessments about them may be explained by an inferential theory of interpretation similar to the one outlined here but with another underlying concept of assumptions.

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11 Robert van Rooij
Granularity, Presupposition, and Knowledge attributions

You are at the zoo next to the zebra cage with your son. The zebras are in plain view and when your son asks you what they are, you tell him. It make all sense for us to say that you *know* that they are zebras. Still, you can't really rule out completely that they are not mules cleverly disguised by the zoo authorities to look like zebras. Dretske (1970) suggests that although you can't you still *knew* that the animals you saw were zebras, the knowledge attribution was still true. It is perhaps not true anymore, because of a context shift due to the mentioning of new possibilities. I argue that this context dependence consist in (i) the relevant level of *granularity*, and (ii) the attributers *presuppositions*. I take this to be an implementation of the Dretske, Stalnaker, Lewis analysis of knowledge (attributions).

Not just any context dependence will do for 'know'. For instance, although there is some similarity with gradable adjectives like 'tall', Stanley (2004) quite clearly showed that there are important disanalogies as well. Whereas 'tall' allows for modifiers (*very*), fits well in comparatives, and is sensitive to comparison classes ('the fly is tall, but the elephant is not'), 'know' does not. This is all just to show that the context dependence won't consist in relating the meaning of the word *with respect to a particular scale*. Instead, what the context gives us is the relevant *level of granularity*.

In natural language we conceptualize and describe the world at different levels of granularity. Hobbs (1985) argues that to represent or conceptualize the world at a coarser-grained level, we can just restrict ourselves by looking only at the *relevant* predicates of our original language. Consider a model $M = \langle I, V\rangle$ for the first-order language $\mathcal{L}$, and take $\mathcal{L}'$ to be a sublanguage of $\mathcal{L}$ containing only its 'relevant' predicates. In terms of the monadic predicates of $\mathcal{L}'$ we can now define an equivalence relation '$\sim_{\mathcal{L}'}$' with respect to language $\mathcal{L}' : a \sim_{\mathcal{L}'} b$ iff $a, b \in I_M$ and for all monadic predicates P of $\mathcal{L}' : M \models P(a) \Leftrightarrow M \models P(b)$. In terms of this equivalence relation, Hobbs (1985) proposed to construct a coarse-grained model M' as follows: (i) the domain $I_{M'}$ is just the set of equivalence classes $I_{M'} = \{\{y \in I : y \sim_{\mathcal{L}'} x\} : x \in I_M\}$, and (ii) the valuation function is such that for all monadic predicates $P \in \mathcal{L}'$, $M' \models P([a])$ iff $M \models P(a)$, where $[a]$ denotes the equivalence class containing $a \in I_M$.

Hobbs (1985) appealingly suggests to account for *type*-identity as identity at a more coarse-grained level of description. He so explains why we cannot say 'A Ford Falcon was heading south on U.S. 101, went out of control, and crashed into the same car' to mean that it hit another Ford Falcon. The reason is that *type*-level identity is just indistinguishability, but only restricted to distinguishable predicates that are *relevant*. Unfortunately, Lasersohn (2000) showed that the truth definition at the coarse-grained level proposed by Hobbs (1985) does not capture the intuitive motivation. It is clear that (1) 'I own a Ford Falcon. The same car is owned by Enzo.' should be interpreted with respect to a coarse-grained model. According to Hobbs' construction, $M' \leq M$ just in case if for every monadic predicate $P \in \mathcal{L}'$, if $P([a])$ is true in coarse-grained model M', it has to be the case that $P(b)$ is true in fine-grained model M, for *every* $b \in [a]$. However, it is clear that in (1) the predicates 'Owned by me' and 'Owned by Enzo' are relevant, and thus part of $\mathcal{L}'$. Because in M' it is the same car that has both of these properties, Hobbs' construction falsely predicts that every token of this car should have both properties in M as well.

Instead of making use of *universal* quantification as proposed by Hobbs (1985), why not make use of *existential* quantification? We assume a surjective function f from the domain of M, I_M, to the domain of coarser-grained model M', $I_{M'}$,[1] that preserves (but not necessarily

[1] A function f from D to D' is surjective iff the range of f is D'.

anti-preserves) each relevant predicate P: if $x \in P_M$, then $f(x) \in P_{M'}$, but if $x \notin P_M$, it need not be that $f(x) \notin P_{M'}$.[2] The other direction follows by contraposition: if $x \notin P_{M'}$, then there is no $y \in f^{-1}(x)$ such that $y \in P_M$. In this case it is not problematic that the predicates 'Owned by me' and 'Owned by Enzo' are relevant, and thus part of $\mathcal{L}'$. It is just important that their negatives are *not* part of $\mathcal{L}'$. To capture the idea of simplification, or coarsening, it is natural to assume that f is *not injective*: it might be that $f(x) = f(y)$, although $x \neq y$. Of course, we want refinements to preserve all the predicates and relations of the restricted language $\mathcal{L}'$, but this preservation is now stated as follows: $M' \leq_{\mathcal{L}'} M$ just in case if $x \in P_{M'}$, then $\exists y \in f^{-1}(x) \in P_M$, for each $P \in \mathcal{L}'$. In general, the truth conditions of sentences in course-grained model M' are defined in terms of their truth conditions in fine-grained model M and function f as follows:

$M', g \models P(x)$ iff $\exists d \in f^{-1}([\![x]\!]^{M',g}) : M, g[^x/_d] \models P(x)$
$M', g \models \neg\phi$ iff $M', g \not\models \phi$ $M', g \models \phi \wedge \psi$ iff $M', g \models \phi$ and $M', g \models \psi$
$M', g \models \forall x\phi$ iff for all $d \in I_{M'} : M', g[^x/_d] \models \phi$.

Notice that $M', g \models \neg P(x)$ iff $\forall d \in f^{-1}([\![x]\!]^{M',g}) : M, g[^x/_d] \not\models P(x)$.

Knowledge attributions and fine-grainedness If we want to account for knowledge, and knowledge attributions, we have to consider modal models with your epistemic accessibility relation R_y.[3] But some modal models make more fine-grained distinctions than others. In one modal model, M', we don't distinguish situations, or worlds, where the animals you see are zebras or mules cleverly disguised in that way (both are called 'zebras'), while in another more fine-grained model, M, we do. With Dretske we might say that the original knowledge claim, or attribution, *made in the original context* was true, because interpreted with respect to coarse-grained model M' (using Galin's TTY): $M', g \models Know(y, \phi, i)$ iff $\forall v \in R_y^{M'}(g(i)) : M', g[^i/_v] \models \phi$, which holds iff $\forall v \in R_y^{M'}(g(i)) : \exists u \in f^{-1}(v) : M, g[^i/_u] \models \phi$.

Presuppositions This analysis is much too weak. In fact, if you cannot distinguish zebras from mules cleverly disguised to look like zebras, it predicts that you also know that the animals you see are cleverly disguised mules. To get rid of this false prediction we need our second type of context dependence: *what the attributers presuppose* (cf. Stalnaker, 1993). If *we*, the attributers, know, or presuppose, that the animals you and your son are looking at are zebras, this will limit the types of worlds we existentially quantify over in the final state. If we model what *we* presuppose by c, the final analysis looks at follows: $M', g, c \models Know(y, \phi, i)$ iff $\forall v \in R_y^{M'}(g(i)) : M', g[^i/_v], c \models \phi$, which holds iff $\forall v \in R_y^{M'}(g(i)) : \exists u \in f^{-1}(v) \wedge u \approx_\phi c \wedge M, g[^i/_u] \models \phi$, where $u \approx_\phi c$ means that the relevant words in ϕ (like 'zebra') have the same meaning in u as in c, i.e., as what we presuppose it to mean.

The sceptic is the limit What we have actually made use of to account for fine-grainedness is a system of *inverse systems*, also used by van der Does & van Lambalgen (2000) to model the meaning of perception verbs. Inverse systems come with *inverse limits*, limits of precision we are searching for but can never quite reach. It is very natural to relate this incapability with the power of the sceptic: you will never quite satisfy her. Fortunately, *we* are only as demanding as we presuppose ourselves to be. So *we* allow *you* to know!

[2] Technically, f is just a homomorphism from M to M' which don't necessarily preserve negative sentences.

[3] I take the accessibility relation to be based on a plausibility ordering so as to implement the idea that logic is belief safe under revision with true information, cf. Lehrer (1990), Stalnaker (1996).

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12 Giacomo Sillari
The Circumstances of Disagreement

Both mainstream and formal epistemologists have confronted the topic of peer disagreement. Two main views on the issue have emerged: following Christensen (2008), call *steadfast* the position of those who think that in face of an epistemic peer's disagreement one should not change their credence in a given proposition, and call *conciliatory* the view of those who think one should. Several contributions from formal epistemologists focus on the *equal weight view*: the claim that, in the face of peer disagreement, one should give both one's own and the peer's opinion equal weight. This strand of literature is connected with numerous recent and less recent studies on the aggregation of individual probability distributions into a consensus distribution. In this paper, however, I focus on a different strand of literature related to the topic of disagreement, namely the wealth of works originated by the so-called agreeing-to-disagree (ATD) theorem by Aumann (1976). The theorem's claim is that the posterior probabilities on any event E of two agents who share a common prior distribution must be equal, no matter how disparate the information on which the agents conditionalize their prior, provided that said posteriors be common knowledge between the agents. The notion of common knowledge (the epistemic state holding in a group of agents in which everybody knows a certain p, everybody knows that everybody knows p, and so on, *ad infinitum*, cf. e.g. Vanderschraaf and Sillari 2005) was introduced in the philosophical literature by Lewis (1969) and is set-theoretically formalized for the first time in Aumann's paper. The ATD literature has considerable value to the peer disagreement discussion. I highlight two elements here: first, ATD models emphasize and make use of the informative value of (peer) disagreement; second, dynamic ATD (in which the common knowledge requirement is dropped, and agreement is reached by the agents communicating their posteriors back and forth, cf. Geanakoplos and Polemarhcakis 1982) results show that the epistemic reaction to disagreement varies according to the (epistemic) circumstances in which agents are situated.

A contribution to the peer disagreement literature based on ATD models, however, requires a preliminary argument. This is because it is tempting to look at the ATD and the peer disagreement literature as conceptually orthogonal: the former deals with agents who receive different, private information and update their priors to the same posterior; the latter deals with agents who receive the same information, and yet manifest a discrepancy in judgments when assessing their confidence on the truth of a given event. In fact, the ATD literature is seldom mentioned and never considered in the peer disagreement debate. Kelly (2005) represents an exception, although he dismisses the ATD literature as irrelevant to the question of peer disagreement largely on the grounds outlined above. Commonsense requires that the asymmetry inherent in peer disagreement be traced back to *some* asymmetry regarding the agents in *some* respect. In my paper I mainly consider the possibility of asymmetry in epistemic performance. That is, while we require that epistemic peers be equal with respect of cognitive capacities, we needn't assume that they be equally good with respect to cognitive performance. In fact, while Kelly (2005) thinks of epistemic peers as agents enjoying same information and same epistemic *virtues*, Sosa (forthcoming) observes that we needn't think of epistemic peers as agents who are fully *employing* their epistemic virtues. There could be a cognitive bias affecting one agent but not the other. Or there could be asymmetries as to how information is processed even though the agents' processing capacity is the same.

Finally, I put ATD models at work and show their relevance to the peer disagreement literature by using them to corroborate a rejoinder of Christensen (2008) against an objection (recoverable in Sosa, forthcoming, and in papers by other philosophers) to a principle underlying the conciliatory view. The principle is dubbed *Independence* by Christensen, and amounts to

requiring that, in the case in which a peer and I disagree on some proposition p, my credence in p should not be part of my evaluation of the epistemic credentials for my peer's disagreeing credence in p. For instance, if my credence in p is 1 and my peer's credence in p is 0, I shouldn't be able to dismiss his (null) degree of belief in p just because I believe that p is the case. Sosa and others put forth counterexamples in which an agent facing disagreement from a peer on an *obvious* proposition p naturally dismisses the peer's disagreement, and she does so on the basis of her belief that p, apparently violating *Independence*. In the final section of my paper, I give formal version of two examples from Christensen (2008) and show that the differences in the epistemic circumstances of the two examples (in particular, the choice of the epistemic operator involved in the modeling, cf. Collins 1997) vindicate Christensen's response to the objection.

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13 Paula Sweeney
Epistemic Modals and Content-relativism

Everyone agrees that epistemic modal claims, such as "It is (epistemically) possible that P" are true/false relative to some body of knowledge or evidence. Disagreement comes with respect to the following two questions; first, whose body of knowledge or evidence is relevant to the truth of an epistemic modal claim and, second, how can our semantics best capture the required variations in truth-value across different contexts. In this paper I propose that the, relatively unexplored (yet see Weatherson, 2008) semantic theory *content-relativism* is best placed to offer a unified account of the semantics of epistemic modal claims.

I begin by giving a brief outline of *content-relativism*. Content-relativism is the thesis that the *content* of a sentence can vary in virtue of variations in the context of *assessment*. The content-relativist shares some common-ground with the standard contextualist as both hold that the *content* of a context-sensitive expression will vary across *contexts*. They are distinct as, for the contextualist, the content varies in virtue of variation in the *context of utterance*; for the content-relativist, the content varies in virtue of variation in the *context of assessment*. The content-relativist also shares some common-ground with the truth-relativist as both hold that variation in truthvalue is a result of a variation in the *context of assessment*. They are distinct as, for the content-relativist, and not the truth-relativist, the variation in truth value is a result of variation in content.

I argue that the content-relativist can meet the truth-relativists (MacFarlane, 2008; Egan, Hawthorne and Weatherson, 2005) challenge to the contextualist (DeRose, 2005; Stanley, 2005). Not only can the content-relativist meet the challenge but he can do so whilst avoiding the need to posit the truth-relativists unpalatable notion of 'relative-truth'. Furthermore, the content-relativist, unlike the truth-relativist, has the resources to accommodate epistemic modals that are embedded under other operators. The truth-relativist can give some pragmatic account of embeddings under belief reports, such as "X believes it is (epistemically) possible that P". However, as Crispin Wright (2007) points out, embeddings under epistemic operators prove to be particularly problematic for the truth-relativist. Wright's challenge can be met by the content-relativist.

Finally, I consider a possible challenge to the content-relativist. If we assume a Stalnakerian model of assertion, where the purpose of assertion is to add a proposition to the common ground, content-relativism seems wildly implausible. For, according to the content-relativist there is not *one* but many propositions asserted with each utterance of an epistemic modal: one for each context of assessment. In response to this challenge I argue that the Stalnakerian model is not appropriate for epistemic modal claims and offer a replacement model of assertion.

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14 Richmond Thomason
Loosening up agents and their propositional attitudes

The beliefs of a single agent are typically treated in logic and philosophy as a single modality or epistemic attitude. I argue that it is better to treat belief as a loosely related family of related modalities. This approach to belief, along with mechanisms for constructing modalities and for activating a modality that is appropriate for a specific reasoning situation, seems to provide a much better model of the relation of belief to intention in deliberative reasoning. I discuss this and other applications of this more flexible conception of belief and similar attitudes.

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15 Crispin Wright
Epistemic Entitlement: Pascal, Reichenbach and the Sceptical Point of View

The proposal (Wright "Warrant for Nothing", *Proceedings of the Aristotelian Society* supp. vol. 2004) that we may be rationally entitled, without specific evidence in their favour, to accept certain basic propositions ("cornerstones") and others on which the good standing of a cognitive project rests, has provoked the reaction among several critics (Jenkins, Pedersen, Pritchard) that the warrant so conferred is not interestingly different from the warrant to accept, e.g. Pascal's wager, that what emerges is at most a kind of pragmatic justification, rather than a genuinely epistemic one, if the sense of 'epistemic' is to be germane to the challenge of philosophical scepticism. The present paper explores, and rejects this suggestion.

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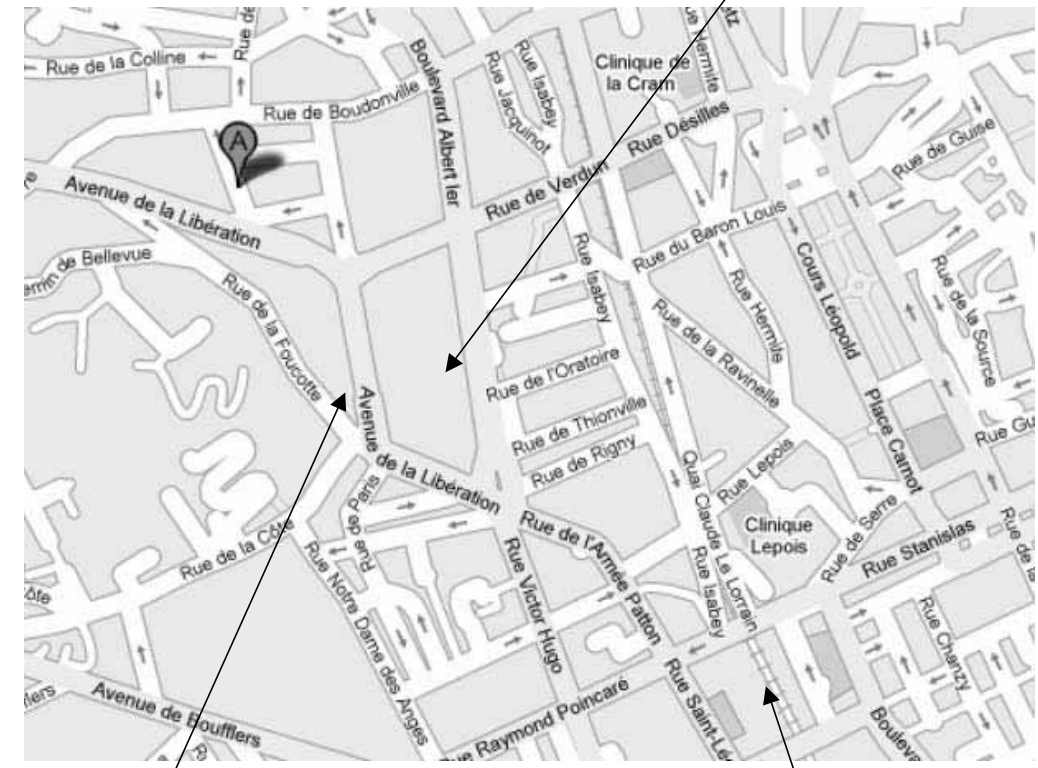
Workshop Epistemology, Context, Formalism

Access



The workshop will take place at the building of the

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Programme

Thursday, Nov. 12
10.00-11.30: Invited talk **Crispin Wright** (Arché, The University of St Andrews) Epistemic Entitlement: Pascal, Reichenbach and the Sceptical Point of View
11.40-12.30: **Peter Baumann** (Swarthmore College) A Contradiction for Contextualism?
14.30-15.20: **Erich Rast** (Universidade Nova de Lisboa) Contexts as Assumptions
15.30-16.20: **Brad Armendt** (Arizona State University) Pragmatic Interests and the Strength of Belief
16.30-18.00: Invited talk **Richmond Thomason** (University of Michigan) Loosening up agents and their propositional attitudes
Friday, Nov. 13
10.00-11.30: Invited talk **Johan van Benthem** (ILLC, Amsterdam & Stanford University) Logics, Mathematics, and General Agency
11.40-12.30: **Julien Dutant** (University of Geneva) Methods-based models for knowledge
14.30-15.20: **Roger Clarke** (University of British Columbia) Contextualizing Degrees of Belief
15.30-16.20: **Dylan Dodd** (University of Aberdeen) Knowledge and belief: eliminating the possibilities
16.30-18.00: Invited talk **Vincent Hendricks** (University of Copenhagen & Columbia University) General Dynamics: Agents and Agendas
Saturday, Nov. 14
10.00-11.30: Invited talk **Hans Kamp** (Universität Stuttgart) Referring and Describing: The Referential-Attributive Distinction from a twenty first Century Perspective.
11.40-12.30: **Paula Sweeney** (University of Aberdeen) Epistemic Modals and Content-relativism
14.30-15.20: **Giacomo Sillari** (University of Pennsylvania) The Circumstances of Disagreement
15.30-16.20: **Robert van Rooij** (ILLC, Amsterdam) Granularity, Presupposition, and Knowledge attributions
16.30-18.00: Invited talk **John Hawthorne** (University of Oxford) Contextualism revisited