CHAPTER 7

THE MANUFACTURE OF BELIEF

RADU J. BOGDAN

1. INTRODUCTION

The beginning of the story is familiar enough. A belief is a mental form with a propositional content, that is, a formal structure of some complexity which encodes some meaningful information that such and such is so and so. This is the sense in which a belief is a mental representation. A belief is also a mental representation with some cognitive or behavioural business. So we can think of belief as a function *from* a content-encoding mental form *to* a cognitive or behavioural role. Such a characterization fits the currently standard notion of belief.

But we have a serious problem here. The problem is that the standard notion of belief is incomplete and inadequate. It accounts for much less than it should. As a result, it projects the wrong picture of belief as a *mental* phenomenon. If belief is thought of as a function from content to role, then understanding belief amounts to understanding the nature of this function, which in turn means understanding the constraints which shape it. What the standard notion of belief fails to identify and explain are precisely the conditions which shape the belief function, that is, the conditions in which a content-encoding mental form comes to play a cognitive or behavioural role and thus becomes a belief. This, obviously, is a very critical failure, for the very essence of belief, that of being a function from mental representation to causal role in cognition and behaviour, is left totally unexplained. Nor is the failure much noticed, let alone deplored. It is standard procedure in current literature on belief to say that a belief is a representation-in-a role without any thought being given to how the two aspects, representation and role, come together in the first place. When we ask, what is it about a mental representation that makes it a belief?, the standard answer is, its playing a role. But that is to beg the question.

For, again, what I am asking is, what is it about a mental representation that makes it play a role in the first place?

This paper is not going to answer that question, certainly not the whole question. But it is meant to go some way towards answering it. The basic idea is this. What is missing from the standard notion of belief is an essential ingredient of mental content, namely, the specific information that mental representations must encode in order to animate the organism's cognition and behaviour and thus becomes beliefs. This, I argue, is going to be an occurrently and incrementally manufactured information. The constraints on this form of information, if they contribute to a representation's becoming a belief, are *ipso facto* going to be constraints on the very function from mental representation to cognitive/behavioural role, the function we associate with belief as a mental phenomenon. That is what the next section is going to establish. But then, if we reflect on the mental nature of these information-inspired constraints on belief, we are bound to conclude that belief is very different from what the standard story tells us it is. This is when, in sections 3 and 4, our story turns less than familiar. For, if the belief function maps occurrently and incrementally formed information onto an appropriate role, then belief is neither a mere disposition, nor an enduring state of some sort, let alone a mere stored representation. Belief draws on these aspects but is reducible to none of them. Belief is occurrently manufactured out of a number of mental dimensions at a central rather than modular level. To have a belief is to manufacture or fix it. This is the sense in which belief is a type of mental performance. Such a notion of belief emerges if we think straight and hard about how mental representations convey the information which drives an organism's cognition and behaviour.

2. THE MISSION DIMENSION

The problem

The standard notion, as we saw, construes belief as a mental representation which plays a cognitive or behavioural role. The mental representation in turn is construed as a syntactic form of some sort, in some code, which represents or refers to some fact or state of affairs. The form, in other words, has an intentional content. Concepts, meanings, recognition patterns, stereotypes, and the like are the ingredients and shapers of intentional contents.

Thus, for example, if a mental representation is a thought-expressing sentence in English, then its form is the grammatical/logical structure of the sentence, and the intentional content the thought or meaning expressed. The intentional content of a (propositional) representation is different from the representation's semantic co-ordinates. The latter determine what (in the world) makes a representation true, the former what (in the mind) makes a representation encode a thought, a meaning, a conceptual structure, or the like. I construe our 'intentional programme' as a sort of basic and minimal conceptual schematism which (in a Kantian way) organizes the syntactic input. Such a programme computes meaning, as conceptual content, in a rigid, automatic, and predetermined way. Many philosophers think that the semantic co-ordinates are also needed to type-individuate a belief. I am going to set this issue on one side since, no matter how solved, it adds nothing to the characterization of belief as a *mental* phenomenon, which is what we are interested in here. There are, therefore, three dimensions to the standard notion of belief: a syntactic form, s, an intentional content or meaning, m, and a cognitive or behavioural role, r. Belief, we saw, can be conceptualized as a function from a mental representation to a role. To put it schematically: $BEL = Rep\ (s,m) \rightarrow (r)$.

An attractively appropriate metaphor for this standard notion of belief is the idea that a belief is a 'map by which we steer'.[1] A map, we can say, is a graphic structure meant to represent a certain territory. It has only syntactic form and, given its purpose, it is meant to have an intentional content, i.e. to represent (be about) something. That is all a map is. The critical problem is: how is the map going to do the steering? How, in particular, is a mental map going to do its cognitive or behavioural steering?

The underlying assumptions behind behind the standard view are (1) that the constraints on Rep(s,m) are the only basic constraints on the mental *content* of the belief function involved, and (2) that additional mental attitudes, such as plans, desires, habits, even other beliefs, will channel that content into the appropriate cognitive or behavioural roles it can play. This is to say that *what* one

---

[1] The full quotation is 'A belief of the primary sort is a map of a neighbouring space by which we steer', from F. Ramsey, *The Foundations of Mathematics* (1931), p. 238. D. M. Armstrong, among others, has articulated this metaphor in some detail in his *Belief, Truth and Knowledge* (Cambridge UP, 1973).

believes is a meaning or intentional content encoded in some formal structure of some sort; and that one's *believing* consists in that content being harnessed to do some job by other mental attitudes and behavioural tendencies.

But this is not going to work. There are many representations we perceive or remember or entertain or infer which fail to become beliefs, although both their syntactic structure and their intentional content are fully computed. We know of cases when, overhearing an isolated sentence, we can compute its syntactic form and basic meaning but that is all we can do. We cannot place it in a context, cannot ascertain its actual aboutness and, most importantly, cannot tell what message it conveys. To say that such representations fail to become beliefs because they fail to engage other mental attitudes is to beg again the original question—a question which can now be restated as: why do those representations fail to engage other attitudes? Suppose it is true, as many philosophers think, that a mental representation becomes a belief by attitudinal integration with other beliefs, plans, and intentions, among other things. My question is, what triggers and motivates such integration? The question asked before, what is it about a mental representation that makes it a belief?, now becomes, what is it about a mental representation that makes other attitudes and behavioural programmes converge on, and interact with, it? Imagine the existing mental attitudes being some sort of 'readers' of incoming representations, programmed to look for some properties which make those representations candidates for belief. What are those attitudes looking for? It cannot be only s and m. This means that the formal and intentional dimensions cannot fully characterize a belief content. It looks as if there must be something more to a content to attract and engage other mental attitudes so that that content moves into a role position and acquires a doxastic status.

The map metaphor can provide a clue. A map is not going to do the steering just by being a map, i.e. a Rep(s). Nor is it going to do the steering just by being made, or meant, to represent some territory and thus guide the steering, i.e. by being a Rep(s,m). Something more is needed. Not, trivially, a map reader but, rather, a traveller who knows where he is and where he is going, besides having some more specific objectives and expectations. It takes this locational information to make the map guide the steering.

You may think that I am adding to our picture of cognition some

sort of homunculus which reads the incoming $Rep(s,m)$ for some specific information, given its instructions, objectives, and available data, in the way our traveller reads the map for specific information which will steer his path, given his instructions, objectives, and available data. In a way I am, although not exactly in this form.[2] But do not, for one moment, believe that this is an arbitrary move, for it is continuous and consistent with other, apparently more natural, hypotheses about cognition. How do you think s and m are established? Take the perceptual input. In itself it is just an aggregation of physical properties. Is there not, in the vision module, a computing homunculus which 'reads' into (or assigns to) the perceptual input specific formal properties—i.e., which maps the input on to an appropriate visual $Rep(s)$? Or do we not say, when the language module is involved, that there is a grammar-computing homunculus which reads into (or assigns to) a collection of noises a specific grammatical structure? And when concepts and other intentional constraints are added, do we not say (or rather mean) that there is an intentional homunculus which reads into (or assigns to) an apropriate $Rep(s)$ a specific meaning structure, thus mapping the former on to a $Rep(s,m)$? So, if it takes a syntactic and then an intentional homunculus (or reader) to construct a mental map or representation, first as a formal structure and then as an intentional structure, would it not be equally natural to assume that it took another information-computing sort of humunculus (or reader), perhaps in different cognitive conditions, to assign to (or read into) a $Rep(s,m)$ some locational information, and thus pave the way for the $Rep(s,m)$ to take on a role and become a belief? If, in the map metaphor, it takes some locational information to make a map capable of and useful for steering, it is fair to assume that a mental analogue of some such locational information must be read into a mental $Rep(s,m)$ in order to get the latter to play a steering role.

It is this analogue of locational information which is missing, as a dimension of content, from the standard notion of belief. The mental content that gets mapped on to a role is not to be characterized merely as $Rep(s,m)$, for in that case we cannot explain the mapping, but rather (at the least) as $Rep(s,m,\square)$, where $\square$ is the slot for the analogue of the locational information. The adequate

---

[2] I construe a homunculus or reader as a metaphoric 'personalization' of an appropriate programme. No genuine reification is meant.

Radu J. Bogdan

characterization of belief as a function from a mentally represented content to a cognitive-behavioural role, then, is going to be BEL = Rep$(s,m,\Box)\rightarrow(r)$. The constraints on $\Box$ are naturally going to be additional and much-needed constraints on the belief function, on its content side. That is what I am going to show next. Once that is done, reflection on how the mind realizes the constraints on $\Box$ shows that $\Box$, as an essential ingredient of belief content, is manufactured only in the central mind, as a matter of occurrent performance. Belief, then, must inherit these features. That is, it must be manufactured centrally and occurrently because that is how the analogue of the locational information a belief encodes is manufactured and because there is no belief without such information. It is as simple as that. In other words, if one is serious about the idea that a belief represents information, then one has to look at the conditions in which such information is fixed. One has *also* to free oneself of the admittedly irresistible prejudice that information is (no more than) what a representation represents, or refers to, or is about (that is, an intentional or semantic content). When one has made these two steps, one is bound to conclude that belief tracks information, not merely the form and the intentional content of the representation carrying that information. One must then conclude that the manufacture of belief is parasitic on the manufacture of the information the belief encodes.

That is what I am going to argue. I begin with a handy illustration.

A story

Babeau and Babette come home and learn that, this time, Pusha has destroyed the cassette of Bruckner's Seventh Symphony. (Pusha hates Bruckner's music and anything else connected with interminable and fuzzy Teutonic romanticism.) Let us suppose that the following aspects are essentially the same for Babeau and Babette: causing event (Pusha mangling the Bruckner cassette); sensory input about it; formal and intentional computations of all sorts; hence the representational output Rep(s,m) to the effect that Pusha has destroyed the Bruckner cassette; desire (to hear the newly bought cassette). Nevertheless, their reactions to the news are different. Babeau is relieved and goes after another cassette, Babette is rather angry and goes after Pusha. The difference in their reactions must originate among other factors in the beliefs they have formed. For this to happen, Babeau and Babette must have

extracted different pieces of information from the same input representation Rep(s,m) to the effect that Pusha has destroyed the Bruckner cassette. Shaped by what they already knew and did not know, their informational expectations were different. Indeed, Babeau knew in advance that Pusha had destroyed a classical-music cassette but did not know which one, whereas Babette only knew that Pusha had destroyed something but did not know what. The same input representation conveyed different information to Babette and Babeau—or, more precisely, different increments in information. Their beliefs must, in some sense, have been shaped by these increments. Let us see how.

The parameters

The central notion is that of *incremental information*. It is what the earlier symbol □ stood for. Let us now abbreviate it as CINF. I construe CINF as an intrinsic part of mental content. I have argued for this elsewhere.[3] Since, by examples like the one above, CINF can be shown to be instrumental in driving cognition and behaviour by causing further beliefs, intentions, inferences, and actions, among other things, it is fair to assume that it operates as part of the belief content. There are, furthermore, a number of parameters that shape CINF for a believer in a given cognitive context. These parameters, as constraints on CINF, can then be construed as constraints on belief as well. I will identify only a few such parameters, enough to serve the cause of my overall argument.

Trivial as it may seem, an initial parameter is the *theme* of one's current cognition in a given context. The reason the theme matters is that more representations reach us than we can actively consider and treat as beliefs. We can, for example, monitor some perceptual input while actively focusing on a particular train of thoughts. The information the latter carry is going to be the current theme of our cognition. Again, at any moment in our story, Babeau and Babette have to handle various sorts of representations, yet (we assume) only those concerned with Pusha's misdeeds constitute their current theme. A theme, obviously, delineates an area of interest and attention. In so doing, it marks a path of relevant informational

---

[3] See R. J. Bogdan, 'Mind, Content and Information', forthcoming in *Synthese*. That paper says more about my notion of incremental information, its precedents (particularly in F. Dretske's work), its competitors, its psychological reality, and its philosophical implications. So it is in fact a companion paper to this one.

continuity as well as the boundaries of potential incrementation and revision. Believing must emerge from within a theme if, as earlier anticipated, belief is not any available representation but rather one 'read' for specific information on which other mental resources (attitudes, inferences, etc.) converge.

The next parameter we want to consider may be called the *issue* parameter. It defines what is informationally at stake in a given context, relative to a theme. In our story, the issue was a specific uncertainty concerning Pusha's doings. Many of our beliefs are formed as a result of removing uncertainties. But an issue may be something different from an uncertainty. It may be a problem to be solved, a question to be answered, a decision to be made, a plan to be formulated, and so on. I would argue that most if not all of our beliefs are issue-bound, in some sense or another. This is because, I think, beliefs are formed or activated in a matrix of thoughts, inferences, intentions, and other processes and attitudes, and those in turn are formed, activated, and brought together in contexts of problem-solving, deciding, or acting, hence, when the organism faces some issue.

This brings us to the next parameter. A target belief about an issue is formed when other beliefs and representations are premised as *given information* in a certain context. This parameter specifies the background knowledge (whatever its source) deemed relevant to the issue in question. A further parameter to consider is the following. When something is at issue, the mind not only summons relevant beliefs to act as given information but also, relative to them and other constraints, projects a number of alternative candidates for the solution. Let us call this the *projection* parameter. It plays a role in our understanding of belief. Typically, one believes something *as opposed to something else*. The projection parameter governs the generation, explicit or not, of such contrasting alternatives. We may assume that the projection parameter works in tandem with some *evaluation* parameter which characterizes the work of some plausibility or likelihood metric. The latter provides standards against which both projected alternatives and the candidate accepted are measured with respect to plausibility and likelihood. If a candidate for a solution to an issue is deemed implausible or unlikely, the organism may be instructed to suspend belief, search for additional information, or start all over again. The projection and evaluation parameters become evident in contexts

where we have to, or want to, quantify the strength of our beliefs by specifying both stakes and alternatives. Scepticism, for example, provides such a context.

Finally, two more parameters. The *new information* specifies the increment which is going to remove an uncertainty, answer a question, or, in general, settle the issue at hand. The new information does not have to be really new; it needs only to be additional information relative to what is available in the context. Once accepted, the new information is integrated into the given information. The result can be called *integrated information*. The updating of our beliefs takes this form of incremental integration. Most if not all of our beliefs are manufactured incrementally in the process of expanding, reconfirming, or revising our knowledge.

Even when we examine and question existing beliefs, with apparently no new information involved, I still want to claim that the framework in which we do so is incremental in the sense that it is governed by parameters like those introduced here. Suppose I ask myself, about an existing belief of mine, 'Do I believe that P?' Note what I am doing. By hypothesis, since it is an existing belief, P is part of my pool of given information, say, a memory item. The theme now is: worry about an existing belief. Specific issue: is P true? I look everywhere in memory for additional given information X. Relative to X and an appropriate evaluation metric I project as relevant the contrasting alternatives P and not-P. After some cogitating, the answer comes in the form of the increment: 'P is true.' As a result, P is returned to doxastic favour and confined again to memory. The framework of this belief fixation is incremental, first, because for a moment 'P is true' was in doubt, therefore its addition to the given information is incremental; and second, because its very addition to and reincorporation into the existing knowledge base proceeded relative to a number of parameters of incrementation. The question 'Is P true?' is, after all, a request for information ('Yes' or 'No'), and, as shown, the way to provide the information and answer the question is incremental. Belief examination, revision, or reconfirmation is as incremental as belief acquisition. All are cases of belief fixation.

There may be other, more distant, parameters which play a role in determining CINF, hence what is believed, but I will stop here. My purpose is not to provide an exhaustive analysis of CINF, let alone of belief content, but rather to show that the presence of

something like CINF in a belief content suggests that the mental-type identity of belief be construed as a sort of central performance or occurrent manufacture. But first let us take stock of our parameters. The first two delineate the 'cognitive ambience' of believing:

(A) (*i*) theme: what is attended to, area of interest
     (*ii*) issue: uncertainty, problem to be solved, etc.

The next parameters specify the mental moves which are being made in order to handle, informationally, the issue in question, moves which amount to the forming and positioning of the appropriate blocks of information:

(*iii*) given information: what is selected and held as fixed
(*iv*) projected alternatives: candidates for the new information
(*v*)   evaluation metric: measuring the candidates for plausibility
(*vi*) the new information
(*vii*) integrated information: updating the given with the new information

Many parameters are often valued by default, automatically. The valuation may to a large extent be unconscious. We typically become aware of it only if something goes wrong or is surprising or something of the sort. I take quite seriously the parallel between the fixation of incremental information, on the one hand, and the syntactic computation of grammatical structure and the intentional computation of meaning, on the other hand. If we are now accustomed to the notion that the latter are unconscious, inaccessible to ordinary intuition, and posited as explanatory constructs, we should treat in the same way more central processes and outputs involving information and mental attitudes. This means, pre-emptively, that ordinary, as well as standard philosophical, intuitions have no privileged access to such phenomena as the fixation of information and belief, nor do they explain them very well.

The content of a belief is manufactured in an incremental environment like that described in (A). Let us motivate this by bringing theory and example together. Babeau was credited with coming to believe that Pusha has destroyed a Bruckner cassette.

This is an incremental belief whose very informal analysis might look liks this:

(B) Theme: Pusha's misdeeds
Given: Pusha has destroyed a classical-music cassette
Issue: uncertainty: which cassette?
Projected: (i) Wagner's *Tristan?* (ii) Bruckner's Fifth? (iii) Satie?
Evaluation: (i) likely, (ii) likely, (iii) certainly not
New: Bruckner's Seventh
Integrated: Pusha has destroyed a cassette of Bruckner's Seventh.

Babette's story, on the other hand, is this:

(C) Theme: Pusha's misdeeds
Given: Pusha has destroyed something
Issue: uncertainty: what something?
Projected: (i) cassette? (ii) bottle of wine? (iii) book?
Evaluation: (i) likely, (ii) very likely, (iii) likely
New: cassette of Bruckner's Seventh Symphony
Integrated: Pusha has destroyed a cassette of Bruckner's Seventh Symphony.

In what follows, my working notion of information is CINF, which is what is implicitly characterized by (A) and illustrated by (B) and (C). No other notion of information is intended or assumed. As we shall see in a moment, CINF does approximate a rather standard notion of information.

Belief and information

The essence of CINF is (at the least) the joint product of the distance or gap between the given and the integrated information *and* the number of alternatives the increment or new information must remove to bridge that initial distance or gap. In other words, one's overall informational gain in a given situation of incrementation is measured by what one needs to know in order to handle the issue one is facing, relative to what one knows already and what one expects. In our story the informational gains of Babeau and Babette are quite different, even though they end up with the same integrated information. For their informational starting points are different. This is why neither the representation of the integrated information nor that of the new information can, *by itself*, charac-

terize the informational gain, CINF, that Babeau and Babette end up with.

To generalize a little, think of the standard notion of information as reduction of uncertainty by elimination of competing alternatives. This is the notion that CINF approximates. The point I am making is that neither an incoming message (corresponding to our new information) nor what the message updates, an existing body of knowledge (corresponding to our integrated information), can fully characterize the incremental information it helps articulate. To specify that incremental information we have to go beyond the message and what it updates, that is, to an initial uncertainty, to what was expected to remove that uncertainty, and so on. The determination of information is a multi-dimensional affair which transcends its individual carriers. Particular mental representations are such carriers. An account of their intrinsic properties is not sufficient to characterize the information those representations carry.

If belief tracks information, it must track such a multi-dimensional configuration of representations as is required to specify CINF. In other words, if CINF is part of what is believed, the belief equation is $BEL = Rep(s,m,CINF) \rightarrow (r)$. Now why would belief track information? Quite honestly, the project of this paper is not to answer this question but rather to exploit its presupposition, namely, that belief tracks information. In other words, my project here has the following conditional format: if belief tracks information, *then* (I want to show) it tracks incremental information and does so occurrently. So the scope of my project extends only to the consequent of this conditional. But I want to touch on the antecedent.

Two intuitive considerations have already been made. One is that we do think of information when we think of belief, whatever the final analysis of the two concepts is going to be. It will be hard to think that the notion of belief content does not have room for the notion of information. One may of course assimilate information to some other dimensions, such as meaning or reference. I shall come to this in a moment. The other intuitive consideration exploits the parallel between belief and information. I have earlier shown how some parameters of incremental information fit our notion of belief. This is particularly obvious if we attend to the ways in which we explicitly and deliberately form and use beliefs, from ordinary to

scientific. A standard case, much studied in inductive logic and philosophy of science, is that of hypothesis formation, which is a case of belief formation. Forming a hypothesis takes place relative to a body of given information (evidence, theory, other hypotheses) and competing candidates (hypotheses). An evaluation metric is summoned to measure the evidential support, informativeness, explanatory power, and other qualities of the candidates. Once formed, a hypothesis can be integrated into the body of accepted hypotheses. And so on. Of all the constitutive components of a belief content, i.e. syntactic form, meaning, information, it must be the shaping of information that this model of hypothesis formation mirrors.

In ordinary life the process of belief formation is more implicit. Some of the parameters are valued by default. But the point remains that the process is more likely to track the shaping of information than that of syntactic form, semantic aboutness, or meaning. Consider perceptual belief (meaning belief that owes a lot to perception, *not* belief fixed within, say, the vision module, for there is no such thing). Imagine yourself seeing something that can be represented as: 'There is an alligator down the corridor'. Think now of how your (reluctant and horrified) doxastic attitude is going to engage this representation, *after* you have made syntactic and intentional sense of it (you know what it represents). You must engage in some incremental manoeuvres if belief is to emerge one way or another. You search, very, very quickly, for relevant given information (on alligators, on their normal whereabouts, on recent events in the neighbourhood, on revengeful students, on recent floods, that the psychology department is tired of rats), then consider some pertinent alternatives (perhaps a Mardi Gras nut, a cat gone berserk, a hallucination), match them against some evaluation metric and so on. You will go through some of the same incremental motions if you hear somebody shouting, 'There is an alligator in the building!' or if you suddenly see a panicky inscription on the blackboard saying the same thing. The form of the input does not matter. The doxastic treatment is of the same type. You do not have to notice the treatment, just its output.

Or look at it this way. What else could a belief track? Forget, for a paragraph or two, your prior intuitions and accept the following stipulations. (1) Rep is a *mental form* iff it satisfies syntactic parameters governing formal operations according to rules. (2) A

mental form Rep is *meaningful* (or has intentional content) iff it satisfies intentional parameters governing pattern recognition, concept application, stereotype subsumption, and so on. (3) A meaningful mental form Rep *refers* iff it satisfies semantic parameters such as reference and truth conditions. (4) A meaningful mental form Rep conveys incremental information iff it satisfies incremental parameters. Now the question we want to consider is, why should belief be allocated only at level (4) and not at a lower level?

If it is not incremental information that belief tracks then the next most promising candidate appears to be either meaning, at level (2), or a mixture of meaning and reference, at levels (2) and (3). Many philosophers think that meaning or meaning + reference can assimilate the notion of information we are after. The concept of semantic information, for example, embodies this assimilationist view. But this is not going to work. Illustrations and arguments here and elsewhere[4] show that (incremental) information can be conceptually disengaged from both meaning and reference. (The tactic, as we saw, is to vary/keep constant the latter two while keeping constant/varying the former.) So one has to choose. My point in the last paragraph but two was that if one looks, even intuitively, at the conditions of belief fixation (from perception to scientific theorizing), one must see that those conditions are more likely to fit our incremental parameters than the intentional or semantic parameters. In which case, given what the latter sorts of parameters specify, a belief content must be more than just a semantically valued intentional content; it must also be information.

Then there is the argument made earlier to the effect that from syntactic form and meaning we cannot get to cognitive or behavioural role without additional constraints which turn out to be constraints on incremental information. This is as it should be since, I take it, we want beliefs to emerge from what representations tell an organism about its environment rather than from the manner in which they tell it, that is, the very processes of computing and assembling the representations in question. What representations tell an organism is information, how they tell it is syntax and intentional content under concepts, or meaning.

Given, then, that belief tracks information and its content is fixed, in party, by parameters of incrementation, our next task is to

---

[4] ibid.

speculate a little on what sort of mental programme (CINF-reading homunculus?) might conceivably execute such incremental fixation of belief.

Cogitation

It should come as no surprise that our parametric model of incremental cognition mimics to a large extent a familiar model of inductive (in particular, eliminative) hypothesis formation and confirmation. Instead of hypotheses we have units of incremental information. The mental induction involved in CINF (hence belief) fixation is not necessarily the deliberate, conscious, reflective induction which the scientist or the professional decision-maker engages in—a form of induction which is a matter of trained practice and argument, and which is studied and rationalized by the philosopher of science, the inductive logician, and the statistician. Nor is CINF fixation the sort of induction which, we are told, the vision and language modules engage in when computing and assembling their basic representations, such as visual images and grammatical expressions—that is, the sort of computational induction studied by psychologists of vision like Marr or modular linguists like Chomsky. Our CINF-fixing form of incremental induction is somewhere in between, building on the outputs of modular induction (i.e. $Rep(s,m)$) and in turn underlying and providing the raw material for rationalized forms of inductive argument used in scientific practice and deliberate decision-making. I will generically call this intermediate form of mental induction *cogitation*—a sort of working synonym for 'cognitive issue-handling'. (Thinking, that is, task-oriented as opposed to idle thinking, may be the most appropriate folk-psychological analogue of my notion of cogitation.) Question-answering, problem-solving, decision-making, inferring, among other things, are, then, species of cogitation. Cogitation amounts to the activation and valuation of incremental parameters. To use a somewhat mechanical analogy, cogitation consists in forming, connecting, and moving around various blocks of information in arrangements appropriate to the cognitive issue to be dealt with. In such arrangements, brought about cogitatively, believing is the attitude to that configuration of blocks of information which satisfies the analysis suggested in (A) and illustrated in (B) or (C). As regards content, belief is an output of cogitation.

There is solid psychological evidence that the processes I lump

Radu J. Bogdan

under the label of cogitation operate incrementally, on flexible units of information shaped by issues, contexts, and parameters such as those discussed here. The evidence comes from (post-modular) perception, memory recall, discourse, and communication, as well as thinking itself. There are also rational design considerations which support the idea that an intelligent system ought to handle information incrementally, in flexible blocks geared to the issues and circumstances in hand. I have documented and discussed this evidence elsewhere.[5] So, assuming the plausibility of this account of cogitation and its implication for understanding belief, let us now put the picture together and show that it portrays belief as a central mental performance.

3. CENTRALITY AND PERFORMANCE

What we have established so far is that we cogitate our way to a belief, the way Babeau and Babette did, when we deploy a number of co-ordinated incremental moves designed to specify and aggregate units of information needed to handle some cognitive issue. Belief, I said, emerges as a relation to a configurational structure formed in this process. To understand belief in this sense is to understand it as a central type of mental performance. To show this I need first a very schematic portrait of the cognitive mind.

A trilateral portrait of the mind

Let us imagine that there are three major functional components of the cognitive mind which play a role in our understanding of belief. I will call them the Representer, the Centre and the Memory. The Representer is responsible for the formation or construction of various sorts of cognitive representations, from perceptual (in various modalities) to linguistic and imagistic. We can think of the Representer as being made of a number of computational modules. The best known are the vision and language modules. What the Representer does, in general, is to take the proximal input in some physical form and assign a syntactic structure and an intentional content to it, in some appropriate code, according to specific rules and instructions. The result, a representational output of the form $Rep(s,m)$, is something that the Centre can then understand, 'read' for specific information and utilize for various purposes. Whereas

[5] ibid.

the Representer's processes, called *computations*, have the task of assembling basic formal representations, the Centre's undertakings, called *cogitations*, such as thinking, inferring, and the like, operate on, and with, already formed representations, putting them to various cognitive and behavioural uses. The Memory, finally, is of course where representations produced by the Representer and handled by the Centre are stored and recalled from.

The strategy of the argument from now on is to show that the Centre alone can cogitate, hence, fix the incremental parameters required for CINF and belief, and that this cogitative fixation is a matter of performance. Let us think again in terms of homunculi or some such programme-personalizing devices. Imagine that there is a Cogitator which is responsible for the incremental fixation of CINF. Given what the Cogitator has to do and the resources it must exploit, it makes intuitive sense to hold that the Cogitator inhabits the Centre. That would make belief, the output of cogitation, a central mental phenomenon. But there is more than intuition supporting the mental centrality of belief. In different contexts, Stich and Fodor have both argued that belief can only be central in the sense that some of the basic properties of belief, such as inferential interaction, conscious accessibility, indifference to causal origin and to the specificity of the sensory input, access to various sources of information available in the system, and so on, can only have extension at the central, post-modular level.[6] These arguments, which I shall not repeat here, seem quite compelling to me. While assuming them to make the case for the centrality of belief, via the centrality of cogitation, I want to go further and, in section 4, argue to the same effect by elimination, that is, by showing that it does not make much sense to attribute believing either to the Representer or to the Memory, or to construe believing as a general underlying disposition. So we can enter, as motivated, the premiss that the Cogitator is central, fixes CINF, and, when other conditions are met, also manufactures belief at a central level.

What about belief as performance? Intuitively, the elements are already in place for showing this. Alerted by a particular cognitive issue, the Cogitator must *delineate* (or *retrace*) a theme, *activate, select,* and *retrieve* relevant portions from the memory knowledge as

[6] See S. P. Stich, 'Beliefs and Subdoxastic States', *Philosophy of Science,* 45 (1978), 499–518; J. A. Fodor, *The Modularity of Mind* (MIT Press, 1983).

given information, *identify* the area where new information is needed, *have access to* and/or *project* several competing candidates for the new information, *activate* and *consult* the relevant evaluation metric, *accept* a particular candidate for the new information, and *integrate* it into the given information. The italicized words refer to processes the Cogitator deploys. As I have suggested, some of these processes can be construed as enabling the Cogitator to assign CINF to (or read CINF into) the various mental representations assembled for this purpose. These are occurrent, context-driven processes, and so must their assignment (reading) of an informational structure be. In deploying these processes, the Cogitator forms a configuration out of the various (input, memory, etc.) representations it 'reads' for information. The configuration is the outcome of the incremental processes italicized above. In this sense, the overall configuration of states which the Cogitator brings together when CINF fixing is (what I call) a performance or occurrent output state.

Since belief is an output of CINF fixing, it too should be characterized as a performance state of the central mind. The characterization itself must be understood as a *principled* or *type-*characterization. In other words, I am not merely saying that a belief token should be construed as a datable, contextual, occurrent mental structure. I am also saying that our very understanding of the notion of belief, as a mental type, requires a performance conceptualization of some sort. Specifically, my argument has been that in order to type identify a set of information-carrying mental representations *as* a belief we have to appeal to an aggregate set of incremental parameters (as mental types themselves) whose joint valuation is occurrent and contextual, and can only be construed as some sort of performance state of some appropriate mechanisms or devices, such as the Centre, and, in particular, the Cogitator. Specific belief tokens, then, are going to be individuated by the specific aggregate values of such parameters.

This account of belief as a performance state does not entail construing belief as a type of action or process or happening or activity or doing. What I suggest, rather, is that we think of belief as a functional and configurational sort of output state which the central mind occupies only when certain parameters (of incremental cognition) are *activated* or *valued*, something which happens only when certain sub-components and processes of the mind

jointly enter into some appropriate states. The general idea, therefore, is to type-construe belief content as a function of several parameters (of incrementation) whose joint valuation specifies an entire configuration of representational states. Belief remains a relation to a configuration of representations. The points that are being made are, first, that it takes such a configuration to specify the informational content of a belief and, second, that the specification itself is a matter of occurrent 'reading' of the relevant representations by the central mind.

So far the argument has gone like this: there is a plausible parametric model of CINF fixation; CINF is part of the belief content, for it is functionally efficacious in cognition and behaviour; the parameters of CINF fixation can be shown to be parameters of belief; but those parameters are activated only by cogitation, hence in a certain sort of performance; therefore, belief must be a sort of performance state of the mind. There is another, somewhat different, way of reaching the same conclusion. It takes as its starting point the mental centrality of belief, a proposition which has been premissed earlier and to which I shall give further support in section 4. This new route exploits the notion that the central mind is nothing but the theatre of complex and occurrent aggregations and interactions of cognitive processes and states which can only be understood in terms of performance. Therefore, if belief is a creature of the central mind, it must be a sort of performance state.

One way of making the argument is by going back, for an analogy, to the good old view of belief as conscious experience. Suppose, contrary to your better judgement, that the good old view is right. Then, I say, belief must be a sort of mental performance state because so is consciousness. You can think of the latter, on the model of attention, as some sort of accessing, reading, and monitoring of representations. These are all occurrent relations to representations. If belief is a conscious experience of some sort, then it must be the output state of such occurrent relations. Disconnect consciousness and those relations of access, reading, and monitoring cease to exist. And so does believing. So believing must be an occurrent sort of relation. To enlarge the picture, remember what the view of believing as consciousness competes with. One competitor is the notion of unconscious belief. This is a viable competitor of the view of belief as consciousness but not of the view of it as *performance*. For what the latter allows, as I think it should, is