

## Mental acts as natural kinds

Joëlle Proust<sup>1</sup>

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### Abstract

This chapter examines whether, and in what sense, one can speak of agentic mental events. An adequate characterization of mental acts should respond to three main worries. First, in contrast with bodily actions, mental acts cannot have fully pre-specified goal contents. For example, one cannot prespecify the content of a judgment or of a deliberation as one can prespecify the end state of a door opening. Second, mental acts seem to depend crucially on receptive attitudes. By that is meant that when you want to remember the name of a city, you must wait for your memory to provide the name. If the name is not immediately recalled, there is little you can do to hasten the process. Third, it does not seem that intentions play any role in mental actions. You normally don't form a prior conscious intention to judge, to consider, remember, or check your perceptual input.

Given these three constraints, mental and bodily actions appear to have a significantly different structure. A careful analysis of the role of normative requirements, distinguishing them from instrumental reasons, allows the distinction between mental and bodily forms of action to be clarified. Two kinds of motives must be present for a mental act to develop. The first kind is instrumental: a mental act is performed because of some basic informational need, such as the need to "remember the name of that play". The second kind is normative: given the specific type of mental action performed, there is a specific epistemic norm relevant to that act (such as truth, coherence, fluency, or consensus). These two motives actually correspond to different phases of a single mental act. The first motivates the mental act, i.e. makes salient the corresponding goal. The second offers an evaluation of the feasibility of the act, on the basis of its constitutive normative requirement(s).

Conceived in this way, a characterization of mental acts avoids the three difficulties mentioned above. The possibility of pre-specifying the outcome of epistemic mental acts is blocked by the fact that such acts are constituted by strict normative requirements. That mental acts include receptive features is shown to be a necessary architectural constraint for mental agents to be sensitive to epistemic requirements (through emotional feelings and other normatively relevant attitudes). Finally, the phenomenology of intending is shown to be absent in most mental acts; the motivational structure of mental acts is, rather, associated with error-signals and self-directed doubtings. Mental acts need to be recognized as a natural kind of action meant to normatively control and enhance cognitive efficiency according to current processing needs.

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<sup>1</sup> Institut Jean-Nicod, EHESS-ENS, Department of Cognitive Studies, CNRS, 29 Rue d'Ulm, 75005 Paris.  
jproust@ehess.fr.

Introduction. What is meant by an "act"?

In contemporary philosophy of action, "mental act" is generally used to refer to the process of intentionally activating a mental disposition in order to acquire a desired mental property. Traditionally, however, there has been a second way of applying the phrase "mental act", in an actualization rather than an agentic sense. In the sense of being an actualization, *act* is contrasted with *potentiality*. In Aristotle's use of the term, potentiality refers to "a principle of change, movement, or rest" in oneself or other entities (*Metaphysics*,  $\Theta$ , 1049b7). An act constitutes the actual expression of this potentiality. For example, a seeing is an act, while the disposition to see is the potentiality associated with it (*Metaphysics*,  $\Theta$ , 1049b21). "Mental act", in this sense, is close to "mental event", in other words, "what happens in a person's mind".<sup>2</sup>

An "agentic" act thus necessarily includes an actualization; an act in the dispositional sense becomes an act in the agentic sense if an instance of the underlying event type can be brought about willingly, rather than being automatically triggered under the combined influences of the mental apparatus and the environment. As a consequence, mental events of a given type (such as imaginings, or rememberings), may qualify as mental acts on one occasion, and not on another. A thinker can think about John, memorize a telephone number, mentally solve a math problem. But these events are not necessarily mental 'doings'. Some instances are voluntarily brought about, in order to make a certain mental content available. Others are associatively activated in the mind by contextual cues.

When one comes up with a nominal distinction such as this, the next question is whether the distinction is real; does it connect to a natural distinction between two natural kinds? Are there, in fact, mental acts in the agentic sense? Is there, furthermore, a reason to consider that supposedly "mental" acts are of a different nature from ordinary bodily actions? Are they not normal ingredients of an action, rather than being independent actions?

To lay the groundwork for the discussion, we need to start with a tentative characterization of the general structure of action, on the basis of which mental acts can be specified. A commonly held view is that both bodily and mental acts involve some kind of

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<sup>2</sup> Geach, 1957, 1.

intention, volition, or reason to act; the latter factor both causes and guides the action to be executed.<sup>3</sup> Along these lines, the general structure of an action is something like:

*(C1) Intending (willing, having reasons) to see goal G realized → (=causes) trying to H in order to have G realized.*

In this sort of characterization, words such as "willing" or "trying" are sometimes taken to refer to independent mental acts. This does not necessarily involve a regress, for although tryings or willings are caused, they don't have to be caused in turn by antecedent tryings or willings.<sup>4</sup> On the basis of this general characterization, one can identify a mental act as an act *H* that is tried in order to bring about a specific property *G* – of a self-directed, mental or cognitive variety. The epistemic class of mental acts encompasses perceptual attendings, directed memorizings, reasonings, imaginings, visualizings. This mixed category, involving a combination of epistemic, prudential or motivational ingredients, includes acceptings, plannings, deliberatings, preference weightings, and episodes of emotional control.

Three main arguments have been directed against the characterization of mental acts described in *(C1)*. First, it seems incoherent, even contradictory, to represent a mental act as trying to bring about a pre-specified thought content: if the content is pre-specified, it already exists, so there is no need to try to produce it (Mele, 2008). Second, the output of most of the mental operations listed above seems to crucially involve events of passive acquisition, a fact that does not seem to be accommodated by *(C1)*. Trying to remember, for example, does not seem to be entirely a matter of willing to remember: it seems to involve an essentially receptive sequence (Strawson, 2003). Third, it makes little sense, from a phenomenological viewpoint, to say that mental acts result from intentions: one never intends to form a particular thought (Strawson, 2003). We will discuss each of these objections, and will examine whether and how *(C1)* should be modified as a result.

### **I – What is an epistemic goal?**

Bernard Williams<sup>5</sup> has emphasized that if beliefs depended, for their specific contents, on believers' arbitrary desires or intentions, then the truth-evaluative property that makes them beliefs would be compromised. What holds for belief acquisition also holds for controlled

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<sup>3</sup> See Davidson (1980), Brand (1984), Mele (1997), Proust (2001), Peacocke (2007).

<sup>4</sup> See Locke, (1689), II, §30, 250, Peacocke, (2007).

<sup>5</sup> See Williams, (1973), 136-151.

forms of epistemic functions, such as trying to remember that *P* or trying to perceive that *Q*. Here a subject cannot want to remember or perceive a given content because it is a condition of satisfaction of the corresponding mental act that it responds to truth or validity, rather than to the thinker's preferences.<sup>6</sup> Even mental acts of the mixed (epistemic and conative) variety also involve constraints that do not seem to merely depend on a thinker's arbitrary goal: when planning, (for example) minimal objective constraints such as relevance and coherence need to be respected, in order to have the associated episode qualify as planning. This kind of observation leads to articulation of the following principle:

*(P1) Mental actions generally have normative-constitutive properties that preclude their contents from being prespecifiable at will.*

In virtue of (P1), one cannot try to judge that *P*. One can try, however, to form one's opinion about whether *P*; or examine whether something can be taken as a premise in reasoning, namely, accept that *P*. Or work backward from a given conclusion to the premises that would justify it. But in all such cases, *accepting that P* is conditional upon *feeling justified in accepting that P*. For example, one can feel justified in accepting a claim "for the sake of argument", or because, as an attorney, one is supposed to reason on the basis of a client's claim. (P1) thus claims that, for a given mental act to occur, some form of sensitivity to normative principles must have been available to the agent. Saying that a mental act is constitutively normative, means that there is a norm to which the agent needs to be sensitive in order to be able to perform this act. Being sensitive to a norm does not amount to saying that mental agents can never be wrong in applying it. It means, rather, that agents perform the action in order to achieve a normatively adequate result. Furthermore, the norm involved determines the kind of mental act that is being performed and its conditions of correction. Various norms may apply to a mental action, constituting it as the mental action it is. In the case of accepting, *coherence* regulates the relations between accepted premises and conclusions. *Relevance* applies to the particular selection of premises accepted, given the overall demonstrative intention of the agent. *Exhaustivity* applies to the selection of the relevant premises given one's epistemic goal.

These norms work as constraints on non-agentive epistemic attitudes as well as on mental actions. Forming, or revising a belief are operations that aim at truth, and at coherence among credal contents. Thus normative requirements do not apply only to mental actions. Mental actions, rather, inherit the normative requirements that already apply to their epistemic

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<sup>6</sup> Obviously, one can try to remember a proper name under a description, such as 'John's spouse's. But this does not allow one to say that the content of one's memory is prespecified in one's intention to remember: one cannot decide to remember that the name of John's spouse is Mary.

attitudinal preconditions and outcomes. If a thinker was intending to reach conclusions, build up plans, etc., irrespective of norms such as relevance, coherence, or exhaustivity, her resulting mental activity would not count as a mental action of reasoning or planning. It would be merely an illusory attempt at planning, or reasoning.<sup>7</sup> A mental agent cannot, therefore, try to  $\phi$ , without being sensitive to the norm(s) that constitute successful  $\phi$ -ings.

The upshot is that characterization (C1) above should be rephrased, as in (C2) in order to allow for the fact that the mental property that is aimed at should be acquired in the "right way", as a function of the kind of property it is.

(C2) *Intending to see goal G realized  $\rightarrow$  (=causes) trying to H in conformity with a constitutive epistemic norm in order to have G realized as a consequence of this normative requirement.*

Characterization (C2) can be used to explain the specific difference of mental versus bodily acts in the following way: just as bodily acts aim at changing the world by using certain means-to-end relations (captured in instrumental beliefs and know-how), mental acts have, as their goal, changing one's mind (i.e. obtaining a new mental content, property, or attitude) by relying on *two* types of norm: means-to-end instrumental norms (for example, "concentrating helps remembering") and constitutive norms ("my retrieval attempt ought to bring about a *correct* outcome"). The specific difference, then, between a mental and a bodily act, is that constitutive norms are only enforced in epistemic acts and attitudes, and that an agent has to be sensitive to them to be able to perform epistemic actions. This does not entail, however, that a thinker has to have normative concepts such as truth or relevance; an agent only needs to practically adjust her mental performance as a function of considerations of truth, exhaustivity, or relevance. There is a parallel in bodily action: an agent does not need to explicitly recognize the role of gravity in her posture and bodily effort to adjust them appropriately, when gravity changes, for example under water. It is an important property of constitutive norms that they don't need to be consciously exercised to be recognized as practical constraints on what can be done mentally. For example, an agent who tries to remember a date, a fact, a name, implicitly knows that success has to do with the accuracy of the recalled material; an agent who tries to notice a defect in a crystal glass implicitly knows that her attempt depends on the validity of her perceptual judgment. Studies in comparative psychology offer compelling evidence that animals with no mindreading are still able to assess whether they can correctly retrieve from

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<sup>7</sup> The difference between a bad plan and an illusory attempt at planning is that, in the first case, the subject is sensitive to the associated normative requirements, but fails to abide them, while, in the second, the subject fails to be sensitive to them.

memory a given icon, or whether they have a distinct perception of a test stimulus. How might we explain that normative sensitivity does not need to depend on a metarepresentation of the attitudes involved and of their specific justification? A plausible explanation is that the properties of informational extraction and transfer constrain mental performance just as the properties of gravity constrain bodily performance. Just as learning processes are so configured (by an association of training with innate dispositions) as to automatically trigger a belief revision when an error is detected, metacognitive processes are so configured as to automatically allow certain norms to become salient in given classes of contexts, and drive the corresponding forms of controlled cognition. Children's difficulty with prying apart norms such as fluency, or consensus, on the one hand, and truth, on the other, suggest that training from parents and teachers may have a central role in allowing the distinctive characters of norms to emerge. From the empirical evidence already collected, very young children might first be sensitive to fluency, relevance, and consensus, evolving later a sensitivity to exhaustivity, accuracy and coherence. A characterization along these lines, however, seems to be blocked by two objections.

A - There are no constitutive norms

Naturalist philosophers are usually prone to claim that there is only one variety of rationality: instrumental rationality. Violations of truth, mistakes, fallacies are merely properties we don't like, such as "foul weather on the day of our picnic" (Dretske, 2000). Epistemic constraints, then, should not be seen as constituting a special category; they belong to instrumental, conditional norms involved in practical reasoning:

(P2) "One ought to adopt the means one believes necessary (in the circumstances) to do what one intends to do".<sup>8</sup>

Given that *what one intends to do* varies with agents and circumstances, some people may prefer to ignore a fallacy in their reasoning, or jump to a conclusion, just as some prefer to picnic in the rain. There are many types of instrumental conditions for attaining goals, and they each define a norm, in the weak sense of a reason for adopting the means one adopts. From this perspective, epistemic norms are no more constitutive for a mental act than beliefs in means-end conditions for realizing a goal are constitutive for a bodily act. They are merely instrumental conditions under the dependence of one's intention to reach a given end. A closely related argument in favor of the instrumental view of epistemic norms, proposed by Papineau

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<sup>8</sup> Dretske (2000), 250. See Christine Korsgaard (1997) for a similar view, where normativity in instrumental reasoning is derived from the intention to bring about a given end.

(1999), is that they compete with each other: one can desire that one's beliefs be formed so as to be *true*, or *informative*, or *economical*, etc. Truth is not an overarching norm; norms apply in a context-relative way, according to the agent's goal.

This kind of argument, however, has been criticized for conflating reasons to act and normative requirements on acting. Adopting John Broome's distinction, (Broome, 1999), one might say that Dretske's proposition (*P2*) above correctly articulates a relation of normative requirement between intending an end, and intending what you believe to be a necessary means to this end. Such a relation is indeed constitutive of an intention to act. But this does not *ipso facto* provide you with a reason to intend what you believe to be a necessary means to the end. Conversely, whatever reason you may have to take this particular means as necessary to reach this end, does not count as normatively required. Let us see why. A reason is "an ought" *pro tanto* – "an ought so far as it goes". For example, if you intend to open a wine bottle, granting that you believe that you need a corkscrew, you ought to get one. Believing that you ought to get a corkscrew, however, cannot make it true that you ought to do so. You ought to do so if there is no reason not to do it. The conclusion of your practical reasoning, finally, can be detached: get a corkscrew! In short, "a reason is slack, but absolute". In contrast, a normative requirement is "strict, but relative". Why is a normative requirement strict? Suppose that, accepting *A*, you explore whether to accept *B*, which is in fact logically entailed by *A*. If you accept *A*, you have no choice but to accept *B*. Entailment does not depend upon circumstances, nor on ulterior reasons. But, in contrast to having a reason, which, being absolute (although "slack"), is detachable, being normatively required to accept *B* (although "strict") is *merely relative to accepting A*: you are not *ipso facto* normatively required to accept *A* in the first place.

The same holds for instrumental reasoning. The relation between intending an end and intending the means you believe to lead to that end is a conceptual requirement for you to form the intention to act. But this does not entail that the specific means intended are normatively required. Therefore, the strict normative requirement expressed in (*P2*) cannot form the agent's end. For it is neither detachable, nor "pro tanto".<sup>9</sup> Broome's distinction between reason and normative requirement allows us to explain why one can understand the normative requirements involved in someone else's instrumental reasoning even when her instrumental beliefs seem wrong, and/or her ends irrational.

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<sup>9</sup> Broome (1999), p. 8. See also Broome (2001).

Broome's distinction also allows us to respond to another argument in favor of the instrumental character of epistemic norms, based on the idea that they can conflict, just as ordinary actions, goals and instrumental conditions can do. In Papineau's presentation of the argument (Papineau, 1999), normative competition derives from agents' having conflicting desires: any one of these desires, for truth, informativeness, or economy, can appear to gain precedence over the others in a particular context. They do this because the norms are conceived of as "slack" and "absolute". In Broome's construal, a conflict among the epistemic ends to be pursued in a mental task does not affect the normative requirements applying to the resulting mental act. Slackness and absoluteness of potentially conflicting reasons is compatible with strictness and relativity in normative requirements. Let us suppose that an agent predicts that she will fail to have the necessary time and cognitive resources to retrieve a list of words that is, say, simultaneously accurate and exhaustive. Various possible epistemic strategies are available; the agent needs to decide which will best serve her current needs. By so doing, she *ipso facto* adopts the (strict, relational) normative requirement(s) inherent in the chosen strategy. An agent may be right or wrong in selecting, under time pressure, a strategy of exhaustivity (this depends in part on the anticipated cost-benefit schedule). But her reason for selecting it has nothing to do with a normative requirement. Normative requirements *only step in once a specific strategy is chosen*. Relative to that strategy, the normative requirements constitutive of this strategy will apply. If the agent aims to be exhaustive, she will aim to find all the true positives, and accept the risk of producing false positives; the normative requirement conditional on this strategy is that she ought to include all the true answers in her responses. If, however, the agent's aim is to retrieve only correct answers, the normative requirement is that no incorrect answer should be included in her responses. Strictly speaking, then, there is no conflict among normative requirements (in the abstract, these requirements are all coherent and subordinated to truth).

So there are two very different ways in which a mental agent can fail in an action: she can select an aim *that she has no good reason to select* (aiming to be exhaustive when she should have aimed at accuracy). Or she can *fail to fulfill the normative requirements that are inherent to the strategy she selected* (aiming to be exhaustive and leaving out half of the items in the target set).

For example, if the agent tries to *remember* an event, no representation of an event other than the intended one will do (although some representations of that event may be more complete than others); the agent, however, may misrepresent an imagining for a remembering. This example can be described as the agent's confusion of a norm of fluency with a norm of



accuracy. Another frequent example is that, having accepted *A*, an agent fails to accept *B*, which is a logical consequence of *A* (maybe she is strongly motivated to reject *B*).<sup>10</sup> Here again, the agent was committed to a norm of coherence, but failed to apply it, while turning, possibly, to another norm, such as fluency or temporal economy, unsuitable to the task at hand.

If indeed there are two different forms of failure, connected, respectively, with goal selection, and with a goal-dependent normative requirement, we should recognize that it is one thing to select the type of mental act that responds to the needs of a given context, and another to fulfill the normative requirements associated with *this* selected mental act. Selecting one act may be more or less rational, given a distal goal and a context. An agent may be wrong to believe that she needs to offer an exhaustive, or a fine-grained, answer to a question, (contexts such as conversation, eyewitness testimony, academic discussion, and so on, prompt different mental goals). Having selected a given goal, however, the agent now comes under the purview of one or several constitutive norms, which define the satisfaction conditions of the associated mental action. The fact that there can be conflicts among epistemic strategies thus just means that an agent must select a particular mental act in a given context, if she is in fact unable to carry out several of them at once. She needs to select one among various mental acts, which are inherently responsive to different norms. Which mental act is needed, however, must be decided on the joint basis of the contextual needs and of one's present dispositions.

If this conclusion is correct, it suggests, first, that mental acts are natural kinds, which are only very roughly captured by commonsense categories such as "trying to remember" or "trying to perceive". One act of directed memory, or perceptual attending, for example, should be distinguished from another if it aims at exhaustivity or at strict accuracy. Similarly, a type of reasoning could be aiming at coherence, or at truth, depending on whether the premises are only being considered, i.e. assumed temporarily, or fully accepted. These are very different types of mental acts, which, since they invoke different normative requirements, have different conditions of success, and also require different cognitive abilities from the agent.

Secondly, the conclusion also suggests that the conformity of present cognitive dispositions with a given normative requirement should be assessed prior to mentally acting: a thinker needs to evaluate the likelihood that a mental action of this type, in this context, will be successful. In other words, a predictive self-evaluation needs to take place for a subject to appropriately select which mental act to perform. For example, a subject engaged in a learning

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<sup>10</sup> The case of an elderly man accepting that he has a low chance of cancer, to avoid being upset, discussed in Papineau (1999), p. 24, is a case of acceptance aiming at emotional control; there is no problem accommodating this case within a normative requirement framework: the norm in this case constitutes a mental act of emotional control; it requires the accepting to be *coherent* with the emotional outcome and *relevant* to it.

process may need to appreciate whether she will be able to remember either accurately, or exhaustively, a set of items. Evaluation should also be made after the action is performed. At the end of a controlled retrieval, the agent should assess whether her retrieval is correct, accurate and/or exhaustive. Differences in normative requirements for mental acts should thus be reflected in various forms of metacognitive evaluations.

#### B - The "Unrefined thinkers" argument

The preceding discussion allows us to deal more quickly with a second objection, offered by David Papineau (1999): epistemic norms cannot be constitutive because they are frequently *unobserved* (ignored), by higher mammals and very young children, or even routinely *violated* by normal believers. Research on reasoning, indeed, provides a wealth of examples where people make major deductive mistakes in evaluating syllogisms, using or evaluating a conditional rule, or perform incorrectly on even elementary problems of probabilistic reasoning.<sup>11</sup> Let us deal first with the violation argument. There is nothing threatening for the constitutive view in the fact that agents can fail to abide by norms. Given that the normative requirements of interest are constitutive of a given act, one can perfectly well accommodate violations as cases in which an agent thought she was trying to  $\phi$  (reason, remember, perceive), but either applied an irrelevant norm for this particular trying, (trying to  $\phi$  through  $\psi$ -ing), i.e. having the illusion of trying to  $\phi$  and actually merely  $\psi$ -ing), or failed to abide by the chosen norm. The first kind of failure may seem quite strange; research on metamemory, however, offers many examples of illusions of this type. Agents can actually try to conjure up a vivid image of a scene (based on third-person narratives, or films), and believe that this mental action is a reliable indicator for remembering one's personal experience of the scene. We can understand why non-sophisticated agents commit such mistakes: indeed the non-conceptual content that allows them to identify a memory as a memory (rather than an imagining) is the vividness and precision, i.e. the fluency with which the memory comes to mind; but imagining may be fluent too, particularly in conditions where the content of the imagination has been primed. Fluency can thus trick subjects into performing a mental action different from the one they think they are engaged in.<sup>12</sup>

The other part of Papineau's "unrefined thinkers" argument reasons that "since young infants, and probably all animals, lack the notion of true belief, they will be incapable of sensitivity to such norms". Papineau considers that the concept of true belief has to belong to

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<sup>7</sup> See Evans (1990).

<sup>12</sup> See, in particular: Kelley & Lindsay, D.S. (1993), Whittlesea, (1993), Kelley & Jacoby, (1998).

the agent's conceptual repertory for her to have a reason to pursue truth, and to be sensitive to the norm of truth when forming beliefs about the world.

It is arguable, however, that, all that is necessary for a subject to be sensitive to truth and other epistemic norms, is some awareness of the conditions of success for acting in a complex world (social or physical). A toddler may want to get back *all the toys* she has lent to another: she thus needs to try to remember them all, even before she understands, in the abstract, concepts such as exhaustivity, truth, or memory.

An objector might insist that one can only become sensitive to *certain* epistemic norms through explicit conceptual tutoring. Organisms can only apply normative requirements if they are sensitive to them, either because evolution has provided such sensitivity, or because social learning has made them sensitive to new norms. Given the internal relations between normative requirements, norm sensitivity, and mental acts, the range of mental acts available to an agent is partly, although not fully, constrained by the concepts she has acquired. In particular, when an agent becomes able to refer to her own cognitive abilities and to their respective normative requirements, she *ipso facto* extends the repertoire of her "tryings" (that is, of her dispositions to act mentally).

This objection is perfectly correct. In response to Papineau's "unrefined thinkers" argument, we should only claim that *some* basic constitutive requirements, at least, are implicitly represented in one's sense of cognitive efficiency. Among these basic requirements, fluency is a major norm that paves the way for the other epistemic norms. A feeling of perceptual or mnemonic fluency, experienced while engaged in some world-directed action (such as reclaiming one's toys), allows a subject to assess the validity of her perceptual judgments, or the exhaustivity of a recall episode.

As briefly indicated above, the idea that sensitivity to some basic normative requirements could have evolved in non-human animals has recently received support from comparative psychology. It has been shown, in various animal studies, that some non-human primates (marine mammals and birds), although not mind-readers, are able to evaluate their memory or their ability to perceptually discriminate between categories of stimuli. Macaques, for example, are able to choose to perform a task when and only when they predict that they can remember a test stimulus, and they have the same patterning of psychophysical decision as humans.<sup>13</sup> This suggests that macaques can perform the mental action of trying to remember, or

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<sup>13</sup> For a review, see Smith et al. (2003).

of trying to discriminate, just as humans do; furthermore, they are able to choose the cognitive task that will optimize their gains, based on their assessment of how well they perceive, or remember, (rather than on stimulus-response associations, which are *not* made available to them).

The obvious question, then, is how animals can conduct rational self-evaluation, (that is, use a form of "metacognition") in the absence of conceptual self-knowledge. A plausible answer, currently being explored by philosophers and cognitive scientists, is that affective states have an essential role in providing the bases of norm sensitivity in animals, children, and also in human adults.<sup>14</sup> A feeling "tells" a subject, in a practical, unarticulated, embodied way, how a given mental act is developing with respect to its constitutive norm, without needing to be reflectively available to the believer. Cues such as contraction of the corrugator muscle, (correlating with a sense of difficulty, experienced when frowning), or the absence of tension, seem to be associated with a gradient in self-confidence about the outcome of the current mental act. This feeling, however, also has a motivational force, making the prospect of pursuing the action attractive or aversive to the agent.

Philosophically, however, the important question is not only how epistemic emotions are implemented,<sup>15</sup> not only how they influence decision,<sup>16</sup> but also how they can contribute to rational evaluation. How can epistemic feelings generate mental contents that actually enable a subject to perform self-evaluation? One possibility is that emotions provide access to facts about one's own attitudes and commitments (Elgin, 1996, 159-161). If these facts are articulated in a propositional way, then emotions are subjected to the agent's self-interpretive activity as a mind-reader. Another possibility, not incompatible with the first, based on the comparative evidence reported above, is that epistemic feelings express affordances in a nonconceptual way (Proust, 2009). On this view, a "memory affordance" (for example) does not need to be represented in conceptual terms: an animal able to control its memory can simply use embodied emotional cues that correlate with reliability. These cues might seem to require an extensive practice in a given task to be extracted. Recent studies, however, suggest that feelings of effort, as well as other feelings of fluency, might be rooted in unconscious

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<sup>14</sup> Koriat, (2000), Proust, (2007), Hookway, (2008).

<sup>15</sup> It is an empirical project to identify the informational sources that are subpersonally involved in generating embodied epistemic feelings. (Koriat, 2000). Temporal cues, having to do with the onset and swiftness of processing, as well as the overall dynamic pattern of the mental episode, may also contribute to forming a global impression, which reliably correlates with an epistemically calibrated outcome.

<sup>16</sup> See Damasio et al. (1996).

learnt heuristics,<sup>17</sup> and that the latter might be transferrable from one task to the next<sup>18</sup>. For example, a subject engaged in a metaperceptual or metamemory task (having to express her confidence in the validity of a given response), seems able to predict that a higher amount of effort in a trial predicts failure (which actually tends to be the case). Effort might thus be consciously represented as a nonconceptual, phenomenal, intensive value, allowing an animal to decide what to do on the basis of this felt “mental affordance”. An interesting confirmation that feelings of effort do not rely on metarepresentation consists in the fact that the effort heuristic that is prompted by mindreading makes the converse prediction, that more effort predicts success.<sup>19</sup> Once a subject has been invited to provide feeling-based judgments of confidence, however, he/she is able to transfer the right sort of prediction to other agents.

This last observation suggests that the two theories presented above may well both be true, and correspond to different, complementary ways in which epistemic emotions can influence rational human decision-making, even in the same individual. An agent may base an epistemic decision on an unconscious heuristic, felt as a cognitive affordance. He may also, if provided access to the relevant information, reinterpret a felt emotion in new terms, or, reciprocally, learn to use emotions gained through practice in order to change his folk-theoretical predictions.

Let us take stock of the discussion so far. Epistemic norms are constitutive of mental acts, rather than being purely instrumental in general goal-directed behavior. Epistemic requirements determine classes of mental acts. Mental agents may be sensitive to constitutive norms either on the basis of a conceptual understanding of the dependence of the success of a mental act on its epistemic conditions, or on the basis of felt emotions (also called “noetic feelings”), that track specific normative requirements. Evaluation of one's mental dispositions (before acting mentally) and post-evaluation of one's mental achievement (once the action is performed) are two steps where sensitivity to constitutive norms is used to select and monitor mental performance.

We have so far been led to retain our characterization (C2) above of mental actions:

*(C2) Intending to see goal G realized → (=causes) trying to H in conformity with a constitutive epistemic norm in order to have G realized as a consequence of this normative requirement.*

## **II - Passivity and mental agency**

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<sup>17</sup> See Koriat & Ackermann, (2010), Loussouarn & al. , (submitted).

<sup>18</sup> See Kornell & al., (2010)

<sup>19</sup> See Koriat & Ackermann, (2010).

A second puzzle, however, is raised by (C2). As frequently pointed out, most mental acts seem to include sequences that are receptive rather than active.<sup>20</sup> In bodily actions, in contrast, we seem able to simulate our action on line, and to monitor our progress to the goal in a continuous way. No such continuity is present in monitoring our mental actions. Let us assume, for example, that I need to recover the name of Julie's husband. Is there anything I can do to recover this name? Should I concentrate? Should I, rather, think about something else? Should I look it up in a list? Either the content pops into the mind, so to speak, or it does not. When the name pops into my mind, this does not look like a consequence of an action, but rather like an effect of associations that allow me to utter a name connected to another name. When it does not, there is not much I can do to *produce* the wanted name.

Even though one cannot truly be said, in the goal-directed sense, to *intend to judge whether P, to recall X*, etc., in the same sense in which one intends to turn on the light, there is a sense, however, in which we deliberately put ourselves in a position that should increase the probability of judging whether *P* or *recalling X*. These outcomes would not occur if the relevant acts were not intentionally performed.<sup>21</sup> Bringing it about that one remembers, or any other controlled psychological operation, therefore, qualifies as a mental act, *insofar as it is produced deliberately*.

But deliberateness alone will not do, and this is a new argument in favor of caution with respect to (C2). As McCann (1974) noticed, someone could believe that she can deliberately control her heartbeat, and be falsely confirmed in her belief when the excitement (produced by her false expectation that she can do it) actually speeds it up. To exclude this type of case, a constraint is needed on the kind of trying responsible for a mental act (or a non-mental one). It must, in general, fulfill a "voluntary control condition" (VCC):

(P3) VCC: *Trying to A necessarily involves an actual capacity of exerting voluntary control over a bodily or mental change.*

Having voluntary control over a change means that the agent knows how, and is normally able, to produce a desired effect; in other terms, the type of procedural or instrumental activity that she is trying to set in motion must belong to her repertoire. Even though interfering conditions may block the desired outcome, the agent has tried to act, if and only if she has exerted voluntary control in an area in which she has *in fact* the associated competence to act. An important consequence of McCann's suggestion is that the agent may not be in a position to

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<sup>20</sup> See for example: Strawson (2003), Mele (2009), Dorsch (2009), Carruthers (2009).

<sup>21</sup> See Mele, (2009), for a similar argument (p. 29).

know whether an action belongs to her repertoire or not. All she knows is that she seems to be trying to perform action *A*. Trying, however, is not a sure sign that a mental action is indeed being performed.

It is compatible with *VCC*, however, that bodily or mental properties that seem *prima facie* uncontrollable, such as sneezing, feeling angry, or remembering the party, can be indirectly controlled by an agent, if she has found a way to cause herself to sneeze, feel angry about *S*, or remember the party. She can then *bring it about* that she feels angry about *S*, or that she remembers the party, etc. Are these *bona fide* cases of mental action? Here intuitions divide in an interesting way.

Some theorists of action<sup>22</sup> consider that an intrinsic property of action is that, in Al Mele's (2009) terms,

*(P4) The things that agents can, strictly speaking, try to do, include no non-actions (INN).*

An agentive episode, on this view, needs to include subsequences that are themselves actions. It must not essentially involve receptivity. Those who hold the INN principle contrast cases such as trying to remember, where success hinges on a receptive event (through which the goal is supposed to be brought about), with directly controlled events, such as lighting up the room". While agreeing that a thinker's intention is able to have a "catalytic" influence on her thought processes, Strawson rejects the view that she can try to entertain mental contents intentionally.

We saw in section 1 that "entertaining a thought content" does not qualify as an action, and cannot even constitute the aim of an action (except in the particular case of accepting). But as Mele (2009) remarks, "it leaves plenty of room for related intentional mental actions". Take Mele's task (a quite complex one) of finding seven animals whose name starts with 'g' (Mele, 2009). There are several things that the agent does in order to complete the task: exclude animal names not beginning with 'g', make a mental note of each word beginning with 'g' that has already come to mind, keep her attention focused, etc. Her retrieving 'goat', however, does not qualify as a mental action, because 'goat' came to her mind involuntarily, i.e. was a non-action. In conclusion: bringing it about that one thinks of seven animal names is intentional and can be tried, while forming the conscious thoughts of seven individual animal names is not (Mele, 2009).

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<sup>22</sup> See Strawson (2003).

One can agree with Mele, while observing that bodily actions rarely fulfill the INN condition. Most ordinary actions involve some passive relying on objects or procedures: making a phone call, for example, presupposes that there exists a reliable mechanism that conveys my vocal message to a distant hearer. Asking someone, at the dinner table, "is there any salt?" is an indirect speech act that relies on the hearer's activity for computing the relevant meaning of the utterance, a request rather than a question. Gardening, or parenting, consists in actions that are meant to make certain consequences more probable, rather than producing them outright. There is a deeper reason, however, to insist that "trying to A mentally" does not need to respect the INN principle. If section 1 above is right, acting mentally has a two-tiered structure. Let us reproduce the characterization discussed above:

*(C2) Intending to see goal G realized  $\rightarrow$  (=causes) trying to H in conformity with a constitutive epistemic norm in order to have G realized as a consequence of this normative requirement.*

There are, as we saw, two kinds of motives that have to be present for a mental act to succeed. A first motive is instrumental: a mental act is performed because of some basic informational need, such as "remembering the name of the play". A second motive is normative: given the specific type of the mental action performed, a specific epistemic norm has to apply to the act. These two motives actually correspond to different phases of a mental act. The first motivates the mental act itself through its final goal. The second offers an evaluation of the feasibility of the act; if the prediction does not reach an adequacy threshold, then the instrumental motive needs to be revised. This second step, however, is of a "monitoring" variety. The thinker asks herself a question, whose answer is brought about in the agent by her emotions and prior beliefs, in the form a feeling of knowing, or of intelligibility, or of memorial fluency. Sometimes, bodily actions require an analogous form of monitoring: if an agent is unsure of her physical capacity to perform a given effort, for example, she needs to form a judgment of her ability based on a simulation of the action to be performed. Mental acts, however, being highly contextual, and tightly associated with normative requirements, *need* to include a receptive component.

In summary, mental agency must adjudicate between two kinds of motives that jointly regulate mental acts. The agent's instrumental reason is to have a mental goal realized (more or less important, given a context). This goal, however, is conditional on her attention being correctly channelled, and on her existing cognitive dispositions for producing the mental goal. Here, epistemic requirements become salient to the agent. Feelings of cognitive feasibility are passively produced in the agent's mind as a result of her attention being channelled in a given



epistemic direction. These feelings predict the probability for a presently activated disposition to fulfill the constraints associated with a given norm (accuracy, or simplicity, or coherence, etc.). Epistemic beliefs and theories can also help the agent monitor her ability to attain a desired cognitive outcome.

Thus, orienting one's attention as a result of an instrumental reason (finding the name of the play) creates a unique pressure on self-evaluation, which constitutes a precondition and a post-evaluative condition for the mental act. One can capture this complex structure in the following theoretical definition of a mental act:

*(C3) Being motivated to have goal G realized → (=causes) trying to bring about H in order to see G realized by taking advantage of one's cognitive dispositions and norm-sensitivity for H reliably producing G.*

This characterization stresses the functional association of normativity and receptivity. Given the importance of normative requirements in mental actions, there has to exist a capacity for observing, or for intuitively grasping, where norms lie in a given case. Constitutive norm sensitivity is a receptive capacity without which no mental action could be performed.

### **III - Intentions and Mental acts**

Although (C3) no longer includes a causal role for intentions, it is necessary to discuss their possible causal role in mental actions, or else give an alternative explanation of how a mental act is caused. As Ryle observed, if a thought presupposed a former intention, namely another thought, we would embark on an infinite regress.<sup>23</sup> It does not seem to be the case, however, that we normally intend to move from one thought to the next. The process of thinking does not seem to be constrained, in general, by prior intentions. In the commonsense view, targeted by the philosophy of action of the last century,<sup>24</sup> a personal-level prior intention causes an action on the basis of a representation of a goal and of how to reach it. Emotional or impulsive actions were shown to resist this explanation; this led to postulating a specific category of intentions, called "intentions in action", supposed to trigger the action at the very moment they are formed.<sup>25</sup> Neither kind of intention, however, fits the phenomenology of mental actions, as has often been noticed.<sup>26</sup> An ordinary thinker, in contrast with philosophers,

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<sup>23</sup> See Ryle (1949) for a general presentation of this argument, and Proust (2001) for a response.

<sup>24</sup> See Davidson, (1980), Brand (1984).

<sup>25</sup> Cf. Searle (1983).

<sup>26</sup> Cf. Campbell (1999), Gallagher (2000).

scientists, mathematicians, or politicians, normally does not form a prior intention to make up her mind about a given issue. Mental acts are generally performed while pursuing some other type of ordinary action, such as shopping, having a conversation, asking for one's toys to be given back, or packing for a trip.

A more appropriate proposal seems to be that a mental action results from the sudden realization that one of the epistemic preconditions for a developing action is not met. One example of an epistemic precondition is the retrievability of the *knowledge* of the various means that are involved in the overall action. For example, conversation requires the ability to fluently retrieve various proper names and episodic facts. Another is the ability to *recognize* spatial or temporal cues (for example, while navigating in a foreign city). When an agent is confronted with such an epistemic mismatch between a desired and an existing mental state or property, she is prompted into the agentive mode. What does this mean, exactly? She needs to bring herself to acquire the mental state in question, or else to substantially revise her plan of action. Note that the agent does not need to represent this situation in any reflective way. She only needs to concentrate on how to make her action possible. This strategy, typically, starts with a self-addressed question: can I find this proper name? Will I be able to recognize my friend's home?

Let us suppose, for example, that you go to the supermarket and suddenly realize, once there, that you have forgotten your shopping list. You experience a specific unpleasant emotion, which, functionally, serves as an error signal: a crucial epistemic precondition for your planned action is not fulfilled, because you seem not to remember what was on the list. When such an error-signal is produced, the representation of the current action switches into a revision mode. Note that this epistemic feeling differs from an intention: it does not have a habitual structure, as an intention normally does, given the highly planned, hierarchical structure of most of our instrumental actions. It is, rather, highly contextual, difficult to anticipate, unintentional, and dependent upon the way things turn out to be in one's interaction with the environment. The error-signal is associated with a judgment concerning the fact that your shopping list is not available as expected.

Now, what we need to understand is when and why this judgment leads to selection of a mental act rather than to a new bodily action.

A - A first hypothesis, - Hypothesis *A*-, is that the error-signal is an ordinary, garden variety action-feedback. It is generated when some expectation concerning either the current motor development of the action, or its outcome in the world, does not match what is observed

(according to a popular "comparator view" of action).<sup>27</sup> But there is no reason to say that such feedback has to trigger a mental act. What it may trigger, rather, is a correction of the trajectory of one's limbs, or a change in the instrumental conditions used to realize the goal. If I realize that my arm does not extend far enough to reach the glass I want, I have the option of adjusting my posture or taking an extra step. When I realize that I don't have my shopping list at hand, I have the option of looking for it, reconstituting it, or shopping without a list. In both situations, no mental act seems necessary.

B - Hypothesis *B* states that the error-signal of interest is not of a postural, spatial or purely instrumental kind (see section 1). The distinction between epistemic and instrumental relevance discussed in section 1, is then saliently involved in the decision process. An instrumental error-signal carries the information that the existing means do not predict success ("shopping will be difficult, or even impossible"). An epistemic error-signal carries, in addition, the information that epistemic norms are involved in repairing the planning defect ("can my memory reliably replace my list?"). The comparator that produces the epistemic error signal, on this hypothesis, has access to the cognitive resources to be used in a given task. To make an optimal decision, the agent needs to be sensitive to the norms involved, such as accuracy or exhaustivity. Norm sensitivity is, indeed, implicit in the practical trilemma with which the agent is confronted: either 1) she needs to interrupt her shopping, or, 2) she needs to reconstruct the relevant list of items from memory, or, finally, 3) she may shop without a list, in the hope that roaming about will allow her to track down the needed items. The trilemma is only available to an agent *if mental acts are in her repertoire*, and if she can select an option on the basis of her contextual metacognitive self-evaluations.<sup>28</sup> Now consider the constraints that will play a role in determining how the trilemma should be solved. The list can be more or less *accurately* reconstructed: the new list can include fewer items than the original list, and thus violate a norm of *exhaustivity* (or quantity). It can include more items than the original list, thus violating a norm of *accuracy* (or truth). As shown in section 1, normative requirements depend upon the goal pursued, but they are strict, rather than pro-tanto. Self-probing her own memory is an initial phase that will orient the shopper toward the normatively proper strategy.

A defender of the *A*-hypothesis usually blames the *B*-hypothesis for taking the principle of Occam's razor too lightly. Here is how the argument goes. Any simple postural adjustment

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<sup>27</sup> See Wolpert et al. (2001). For an extension to mental action, see Feinberg (1978).

<sup>28</sup> Agents with no metacognitive ability would not have the ability to represent some equivalent of the trilemma; in such cases one can predict that such agents would randomly interrupt the action (choice 1) or persevere (choice 3), with no correlation with what they actually can remember.

can, from a *B*-viewpoint, be turned into a mental act. When realizing that a movement was inadequate, you engaged into a reflective episode; you compared your prior (estimated) belief of the distance between your arm and the glass with your present knowledge of the actual distance. A precondition of the current action fails to be met. As a result, you actively revise your former belief, and, as a consequence, you reflectively form the mental intention to perform a corrective postural action. Surely, this picture is over-intellectualist. Any animal can correct its trajectory to reach a goal: no mental act, no comparison between belief states are needed; a navigating animal merely compares perceptual contents; it aims at a matching state, and perseveres until it gets it.

The *A*-objector correctly emphasizes that the concept of a "mental property" *can* describe any world property one cares to think about. A color, a shape, become mental once seen. A behavior becomes mental as soon as it is anticipated or rehearsed. A more economical theory, the objector concludes, should explain actions through first-order properties; what is of cognitive interest is the world, not the mind turning to itself to see the world.

The *B*-defender, however, will respond that the *A*-objector ignores existing psychological mechanisms that have the function of assessing one's cognitive dispositions *as such* - they are not merely assessing the probability of the world turning or not to be favorable to one's plans. Indeed crucial evidence in favor of the *B*-hypothesis consists in the contrast between animals that are able to perform metacognitive self-evaluation to decide what to do, such as most non-human primates and dolphins, and those unable to do so, as rats.<sup>29</sup> Metacognitive self-evaluation, however, is not in itself a mental action. It is the initial and the last step of such an action, in a way that closely parallels the functional structure of bodily actions. Neuroscientific evidence suggests that a bodily action starts with a covert rehearsal of the movement to be performed.<sup>30</sup> This rehearsal, although "covert", is not a mental action, but rather, a subpersonal operation that is a normal ingredient of a bodily action. Its function is strictly instrumental: to compare predicted efficiency with a stored norm. Similarly, a mental action starts with evaluating whether a cognitive disposition can reliably be activated. Its function is, as argued in section 1, directly critical and indirectly instrumental. Its critical function is to evaluate how reliable or dependable my own cognitive dispositions are relative to a given normative requirement. Its instrumental function is to guide a decision to act in this or that way to attain the goal. The parallel also applies to the ultimate step of an action: once an action is performed, it must be evaluated: does the observed goal match the expected goal? Again, there is an

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<sup>29</sup> See Hampton (2001), Smith et al. (2003). For a skeptical analysis of this evidence, see Carruthers (2008).

<sup>30</sup> See Krams et al. (1998).

interesting difference in post-evaluating a bodily and a mental action. In a bodily action, sensory feedback normally tells the agent whether there is a match or a mismatch. In a mental action, however, the feedback is of a different kind: the subject needs to appreciate the normative status of the output of the mental act: is the name retrieved correct? Has the list been exhaustively reproduced? Here, again, a subject is sensitive to the norms involved in self-evaluation through a global impression, including feelings of fluency, coherence, etc. as well as situational cues and beliefs about his/her competence with respect to the task involved.

The upshot is that, from the *B*-viewpoint, the existence of metacognition as a specifically evolved set of dispositions is a crucial argument in favor of the existence of mental acts as a natural kind, distinct from motor or bodily acts. Let's come back to the error-signal as a trigger for a mental action. In the shopper example, the error-signal that makes a mental action necessary is the absence of an expected precondition for an ordinary action: the shopping list being missing, the agent must rely on her unaided memory. It is interesting to note that the list itself represented an attempt to avoid having to rely on one's uncertain memory to succeed in the shopping task. The anticipated error to which the list responds is thus one of failing to act according to one's plan. Externalizing one's metacognitive capacities is a standard way of securing normative requirements as well as instrumental success in one's actions.

The error-signal often consists in a temporal lag affecting the onset of a sequence of action. For example, in a conversation, a name fails to be quickly available. The error-signal makes this manifest to the agent. How, from that error-signal, is a mental act selected? In some favorable cases, an instrumental routine will save the trouble of resorting to a specific mental act: "Just read the name tag of the person you are speaking to". When, however, no such routine is available, the speaker must either cause herself to retrieve the word, or else modify the sentence she plans to utter. In order to decide whether to search her memory, she needs to consider both the uncertainty of her retrieving the name she needs to utter, and the cost/benefit ratio, or utility, of the final decision. Dedicated noetic, or epistemic, feelings help the agent evaluate her uncertainty. These feelings, however, are functionally distinct from the error-signals that trigger mental acts. Nonetheless, the emotional experience of the agent may develop seamlessly from error signal to noetic feeling.

Some readers at this point might be worried by an apparent contradiction in the theory presented above: if we take prior intentions to be generally lacking in mental actions, then we can no longer claim that intentions control and monitor our mental actions, and we can hardly characterize mental actions in terms of "being motivated to have goal G realized". How, then,

are mental actions controlled and monitored? To address this question, one needs to observe that the proper role of an intention is to represent a goal as *motivating* a bodily move: action selection and guidance of a bodily action is effected, not by the intention itself, but by the inverse and forward models associated with it. In the case of mental actions, the error signal offers a motivation similar to that of bodily intention; cued models, associated with the error signal, are, here also, necessary to select and guide the proper cognitive operations until goal completion. In spite of these analogies, however, two important contrasts emerge.

First, as discussed above, the goal representation of mental action does not need to be conceptually articulated. A cognitive affordance needs rather to be perceived as available. A prior intention, in contrast, needs to have a conceptual content. Second, inverse and forward models differ strikingly in their representational format: representing a sequence of motor cues and their correlates (changes in the world) has little in common with representing time lags, amounts of cue activation, and their correlates (specific cognitive changes — retrieval, learning, etc.). Therefore any attempt to find a tight match between the structure of mental and bodily actions is misguided.<sup>31</sup>

In summary, our discussion of the shopper example suggests, first, that the error-signal that triggers a mental act has to do with information, and related epistemic norms; and second, that the mental act is subordinated to another encompassing action, that itself has a given utility, i.e. a cost-benefit schedule. The two acts are clearly distinct and related. A failure in the mental act can occur as a consequence of overconfidence, or for some other reason: it will normally affect, all things being equal, the outcome of the ordinary action. An obvious objection that was discussed is one of hyper-intellectualism: are not we projecting into our shopper an awareness of the epistemic norms that she does not need to have? A perceiving animal clearly does not need to know that it is exercising a norm of validity when it is acting on the basis of its perception. We have to grant that norm sensitivity need not involve any conceptual knowledge of what a norm is. Depending on context, an agent will be sensitive to certain epistemic norms rather than others, just as, in the case of a child, the issue may be about getting back all the toys, or merely the favored one. She may also implicitly recognize that the demands of different norms are mutually incompatible in a given context. If one remembers that normative requirements apply to attitudes as well as to mental actions, then the question of

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<sup>31</sup> The temptation to analyse the error signal as a "proximate intention to act" (Pacherie & Haggard, 2010) should, on the present view, also be resisted, because such an intention belongs to a representational process that does not need to be involved in mental actions.

normative sensitivity is already presupposed by the ability to revise one's beliefs in a norm-sensitive way, an ability that is largely shared with non-humans.

### **Conclusion**

A careful analysis of the role of normative requirements as opposed to instrumental reasons has hopefully established that mental and bodily forms of action are two distinct natural kinds. In contrast with bodily action, two kinds of motives have to be present for a mental act to develop. A first motive is instrumental: a mental act is performed because of some basic informational need, such as "remembering the name of the play" as part of an encompassing action. A second motive is normative: given the specific type of mental action performed, a specific epistemic norm must apply to the act (e.g., accuracy). These two motives actually correspond to different phases in a mental act. The first motivates the mental act instrumentally. This instrumental motivation is often underwritten by a mere time lag, which works as an error signal. The second offers an evaluation of the feasibility of the act, on the basis of its constitutive normative requirement(s). Self-probing one's disposition to act, and post-evaluating the outcome of the act, involve a distinctive sensitivity to the epistemic norms that constitute the current mental action.

Conceived in this way, a characterization of mental acts eschews the three difficulties mentioned at the outset. The possibility of pre-specifying the outcome of an epistemic mental act is blocked by the fact that such an act is constituted by strict normative requirements. That mental acts include receptive features is shown to be a necessary architectural constraint for mental agents to be sensitive to epistemic requirements, through emotional feelings and normatively relevant attitudes. Finally, the phenomenology of intending is shown to be absent in most mental acts; the motivational structure of mental acts is, rather, associated with error-signals and self-directed doubting.

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