



Singular thought without temporal representation?

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Abstract

What is required for an individual to entertain a singular thought about an object they have encountered before but that is currently no longer within their perceptual range? More specifically, does the individual have to think about the object *as* having been encountered in the past? I consider this question against the background of the assumption that non-human animals are cognitively ‘stuck in the present’. Does this mean that, for them, ‘out of sight is out of mind’, as, e.g., Schopenhauer seems to have thought? I suggest an alternative answer, also drawing on some empirical work on animal cognition.

Keywords Memory · Singular thought · Animal cognition · Temporal representation

1 Singular thought, time, and animals

What is required for an individual to entertain a singular thought about an object they have encountered before but that is currently no longer within their perceptual range? Clearly, memory of some sort has to be involved— at least in so far as it is that previous encounter on which the individual’s singular thought is based, as I will assume in what follows.¹ Yet, what kind of memory, exactly? James Openshaw (2022) has

¹ Thus, there are some other types of singular thought I will not discuss, such as singular thoughts involving a proper name, ones that are based on a causal inference (e.g., about the person whose footprints I see on the beach), and potentially other types of singular thought that do not meet what Jeshion (2010) calls an ‘acquaintance condition’. I am grateful to James Openshaw for prompting me to clarify this. For similar reasons, when talking about memory, I will set aside accounts of memory on which it is possible to remember particulars even though one has not encountered them oneself (Michaelian, forthcoming).

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recently argued for a distinction between two different types of memory, each of which might underwrite singular thoughts about objects— episodic memory, on the one hand, and what Openshaw calls ‘objectual memory’, on the other.² Whilst both episodic memory and objectual memory can ground singular thought about objects, he argues, in the case of episodic memory this goes via remembering a particular event involving those objects, whereas in the case of objectual memory it does not: One simply remembers the object, even though one may no longer recall any particular event involving it. (Or at least it is not the case that one’s memory of the object is dependent on the memory of a particular event involving it.)

In this paper I want to go, as it were, one step further than Openshaw, suggesting that we may need to distinguish between at least *three* types of ways in which memory can underwrite singular thought, making Openshaw’s ‘objectual memory’ something of a half-way house between the other two. Central to my discussion will be what I will call the ‘Temporal Reasoning Condition’ on memory-based singular thought (I will say more about this particular label later in the paper):

Temporal reasoning Condition Memory-based singular thought about objects not currently perceptually presented requires the ability to think of the object in question as having been encountered in the past.

As is the case with episodic memory, what Openshaw calls objectual memory meets the Temporal Reasoning Condition. That is to say, as he conceives of objectual memory, it involves an awareness of the relevant object *as* having been encountered in the past, even though it may not involve the memory of any particular such encounters.³ Yet I think we can ask whether there could not be types of memory-based singular thought about objects that do not meet the Temporal Reasoning Condition in the first place. This is of course not to say that one could have a memory-based singular thought about an object without ever having encountered the relevant object⁴— the issue is whether one’s way of thinking about the object has to go by way of *thinking of it as* having been encountered before.

My primary aim in this paper is simply to draw attention to the Temporal Reasoning Condition as an assumption that can be seen to be at play in the work of a number of philosophers, even if it is rarely argued for in any detail. However, I will also use a particular device to bring out the potential significance of the status of the Temporal Reasoning Condition. As I will argue, one specific way of approaching questions about the status of the Temporal Reasoning Condition is by asking whether non-human animals (henceforth I will typically simply refer to ‘animals’; dogs in particu-

² The term ‘episodic memory’, as it is being used in the contemporary literature in both psychology and philosophy, was coined by Tulving (1972, 1983). For relevant work in philosophy, see Hoerl (2001), Martin (2001), Soteriou (2008), Michaelian (2016), Fernández (2019).

³ As Openshaw puts it, in objectual recall “one knows (‘by description’, we might say) *that* there are some experiences in one’s past [of the relevant object] which had *this* approximate type of phenomenal character, so to speak. But it does not follow that such experiences are *what* one remembers” (Openshaw, 2022, p. 14). I will set aside the role that knowledge of a past experience’s phenomenal character plays in Openshaw’s account in what follows— though see also Hoerl (2022).

⁴ See footnote 1.

lar will feature heavily in what follows) can have singular thoughts about objects not currently within their perceptual range— or indeed have singular thoughts at all. A key assumption in the background, which I will not argue for here, will be the idea that animals are not capable of temporal reasoning (and *a fortiori*, of meeting the Temporal Reasoning Condition on memory-based singular thought).

In the next section, I will say a bit more about the rationale behind this approach, before looking at some of the (relatively sparse) existing work in philosophy that bears on the question of singular thought in animals. In the second half of the paper, I will then provide a broader framework for understanding the idea that animals are not capable of temporal reasoning, before looking at one concrete study of animal behaviour that I think can serve to illustrate the question as to whether they might nevertheless be capable of singular thoughts about objects outside their current perceptual range. My conclusions will be somewhat tentative; my main aim is to sketch some reasons for thinking that singular thought about objects not currently perceived does not need to meet the Temporal Reasoning Condition.

2 Memory-based singular thought: setting up the issues

As an initial way of motivating my inquiry, note that both episodic memory and objectual memory, as Openshaw conceives of it, involve thoughts most naturally expressed in the past tense.⁵ Yet, arguably, *present-tensed* thoughts about particular objects can also often be based on memory, especially if they are about objects not currently within sensory range. Indeed, there can be fluid transitions between each type of thought, such as when someone says ‘Oh, I remember Ms Patel, who was always very nice. I wonder whether she is still teaching at the school.’ It looks like both the first and the second sentence in this example have to draw on memory for the identification of their referent, but only the first seems to straightforwardly fit the mould of either episodic memory or Openshaw’s objectual memory. So we are faced with the question of how we should think of the type of thought expressed in the second.

There are aspects of this question that can be obscured by looking exclusively at human cognition. To take one example, John McDowell, speaking specifically about the cognitive capacities of a “self-conscious subject [who] necessarily has the idea of himself as having traced some definite part of the world” (McDowell in Evans, 1982, p. 299), goes on to say that it is also “undeniably the case that at least part of the conception that one has of an individual one can think of [in a memory-based way] is that it is a conception of an individual which one has met” (ibid.). This I think is very likely to be true of self-conscious human beings with a conception of themselves tracing a path through time and space, as McDowell supposes. Yet, what it may tell

⁵ In what follows, I will be playing rather fast and loose with notions such as ‘thought’, ‘belief’, ‘model’, or ‘representation’ as being involved in memory, and indeed with the idea that all types of memory can be analysed in such terms. This is because my main focus is elsewhere, but I acknowledge that a more comprehensive discussion would also have to extend to the question as to whether these are the right categories in which to describe the relevant notions of memory.

us about the constitutive conditions for the very capacity for singular thought is much less clear. (I will say more about McDowell's view below.)

This is why I think it is worthwhile to approach questions about the Temporal Reasoning Condition by considering specifically the extent to which non-human animals might be capable of singular thought. In doing so, I will help myself to the assumption (which I will not argue for here) that there is an important sense in which animals, in contrast to humans, are cognitively 'stuck in the present'.⁶ Versions of this idea have been a long-standing trope in philosophy. In a particularly stark statement of the view, Dewey (1920, p. 1), for instance, writes that "all [that] marks the difference between bestiality and humanity, between culture and merely physical nature, is because man remembers, preserving and recording his experiences". The thought here is that animals' 'merely physical nature' may require a capacity to learn from past experience and form expectations on the basis of it that can inform their actions; but this does not necessarily require the ability to retain those particular past experiences in memory as such, since the past itself is gone and will not come again. Indeed, there is a substantive question as to what role the ability to recollect the past as such plays in humans' life.⁷

Suppose, then, that it is true that animals are cognitively 'stuck in the present'. This makes them particular good candidates for investigating whether we should accept the Temporal Reasoning Condition on memory-based singular thought. For the purposes of this paper, I will therefore focus in particular on the question as to whether—despite what the Temporal Reasoning Condition, taken together with the assumption that animals are cognitively 'stuck in the present', seem to imply—animals might nevertheless be credited with singular thoughts about objects not currently within their perceptual range. As far as I am aware, this question has only occasionally been considered in the philosophical literature, and it has rarely been the direct focus of attention.⁸ In what follows, I will put it centre stage.

⁶ For further discussion, see Hoerl (2008) Hoerl and McCormack (2019a, b). Indeed, what will be at issue as we go on is not so much the first order question as to whether this assumption is true, but rather the conditional question as to what follows regarding animals' abilities to have singular thoughts *if* we take it to be true. Something of a model for this type of endeavour can be found in Strawson (1959), who considers the converse case of a (hypothetical) creature living in a world without space.

⁷ For an illustration of the issue, consider Édouard Claparède's (1911) famous experiment in which he pricked one of his amnesic patients with a pin hidden in his hand. Subsequently, the patient showed no recollection of the incident, but refused to shake Claparède's hand again, on the grounds that "sometimes people hide pins in their hands". Recent attempts to address the role that memories of particular past events play in humans' cognitive (and indeed social) life include, e.g., Henry and Craver (2018); Hoerl (2008); Hoerl and McCormack (2010); Hoerl and McCormack (2016); Mahr and Csibra (2017).

⁸ My focus in this paper is particularly on animals' abilities for temporal cognition. However, a further question one might raise here is whether the thought that one has encountered a certain item before involves metarepresentational capacities that animals do not possess (see Hoerl, 2018, for a discussion of related issues).

3 Animals as stimulus-response creatures

By way of a brief historical excursus, in this section I want to provide one plausible example of a philosopher in whose views an endorsement of the Temporal Reasoning Condition can be seen to be at work. Although this is not a paper in the history of philosophy as such, I include this material because it can serve as an illustration of the resulting combination of views— of animals as both being cognitively stuck in the present, and as being unable to have singular thoughts— that I will attempt to unpick in the rest of the paper. (For a more recent expression of similar views— on which animals are restricted to responding to Gibsonian affordances— see Campbell, 2011.)

As the title of Arthur Schopenhauer's (2009) 'Prize essay on the freedom of the will' makes clear, it is not primarily intended to be an essay intended for readers looking for a philosophical discussion of the nature of singular thought. Yet, one can find in it some remarks, in particular about the cognitive capacities of animals, that can be seen to show the potential consequences of endorsing the Temporal Reasoning Condition on memory-based singular thought.

Schopenhauer himself owned a series of poodles, and apparently became increasingly more fond of them than of other human beings as his life went on. The novelist Thomas Bernhard even has one of his characters say that "Schopenhauer was ruled in the end not by his head, but by his dog."— adding, in his customary style: "This fact is more depressing than any other" (Bernhard, 1984, p. 52). Despite his fondness for his dogs, however, in his Prize Essay Schopenhauer describes animals as having severely limited cognitive capacities when compared with those of humans. As he claims (2009, p. 56), whereas humans can entertain what he calls "non-intuitive [...] representations",

[a]nimals, even the cleverest of all, go without this capacity: hence they [...] know only what is directly present, live in the present alone. [The] consequence of this is that they are granted extremely little choice, in fact merely between things that lie before their own restricted field of vision and faculty of apprehension, hence what is present in time and space, the stronger of which at once determines their will as motive.

In Schopenhauer's view, it appears, animals are what might be described as mere stimulus-response creatures. This perhaps allows for certain forms of learning or conditioning that can affect interactions with items that have already been encountered previously when they come into perceptual range again, but without it implying a capacity to represent those items during periods when they are not perceived. That is to say that, in the case of animals, that "which at once determines their will as motive" when they come into perceptual contact with certain items again, may be in part determined by the animal's past learning history. However, the most that Schopenhauer's view would seem to allow for under this heading is a purely causal influence, outside the animal's own ken.

Note that a crucial element of this view is that it seems to make no distinction between animals "liv[ing] in the present alone" in a temporal sense and them being sensitive only to things that are *perceptually present*, i.e., spatially within their sen-

sory range. (The English *present* translates the German *gegenwärtig*; both allow for temporal as well as spatial readings.) Appropriating a familiar slogan, we might say that, for animals, according to Schopenhauer, ‘out of sight is out of mind’. If we look for a motivation of this view, even though it may not figure explicitly in what Schopenhauer is saying, I think a good candidate is what I called the Temporal Reasoning Condition on memory-based singular thought. Schopenhauer, I think correctly, brings out the consequences of endorsing this condition at the same time as denying animals the ability to think about the past and the future: They are incapable of entertaining singular thoughts about items not currently in their perceptual range. Below I will consider some actual empirical research in comparative psychology that may shed light on this issue. However, before this, I will look at some more recent work on singular thought in philosophy in which the Temporal Reasoning Condition becomes a somewhat more explicit subject of discussion.

4 Recognition-based singular thought

In contrast to Schopenhauer’s ‘Prize Essay’, much of Gareth Evans’ *The Varieties of Reference* is directly devoted to considerations about the nature of singular thought, although, as we will see, Evans also only comments in passing on the consequences of these considerations for the cognitive lives of animals. As is well known, Evans died very young— at the age of 34— and before being able to complete the work on his book. It was therefore published in a version edited by John McDowell, in which McDowell tries to fill some gaps by using material from Evans’ other published works, but also sometimes gives his own views on what he sees as some of the more developed philosophical positions that Evans might have arrived at, had he had more time to work on them. Some of what McDowell says, and the contrast with what is there in Evans’ own words, is directly relevant to our purposes. Here is McDowell in his own voice, in a commentary on Chap. 8 of *The Varieties of Reference*:

An account of memory-based singular thinking would have two components: first, an ‘information-link’ between the subject and the object (the subject’s possession of retained information derived from an encounter with the object); and, second, an account of how the subject knows which object is in question. The first component can be present when the second is missing, if the subject retains information derived from an object but (a) cannot place the object in his own past and (b) would not recognize the object if confronted with it (McDowell in Evans, 1982, p. 299).

McDowell’s claim (a) arguably implies what I have called the Temporal Reasoning Condition on memory-based singular thought. Here it is again:

Temporal reasoning Condition Memory-based singular thought about objects not currently perceptually presented requires the ability to think of the object in question as having been encountered in the past.

We can think of McDowell's claim (b) in terms of a different condition, the Recognition Cognition, which he claims is the main focus of the chapter in Evans' book-headed 'Recognition Based Identification'— that he comments on:

Recognition Condition Memory-based singular thought about objects not currently perceptually presented requires the ability to recognize the object.

McDowell's words suggest that he thinks that both the Temporal Reasoning Condition and the Recognition Condition are in fact conditions on memory-based singular thought in general.⁹

Yet immediately after the passage just quoted McDowell concedes that Evans himself might not, in the same way, have thought of the Temporal Reasoning Condition and the Recognition Condition as both necessary conditions for memory-based singular thinking, holding instead the view "that recognition-based thinking about an object constitutes an autonomous mode of identification" (ibid.). This might open up the possibility of an account that allows for forms of memory-based singular thought that do not necessarily involve the Temporal Reasoning Condition being met.¹⁰

McDowell's interpretation of Evans gets support from some programmatic remarks made by Evans in the chapter McDowell comments on.¹¹ At one point Evans describes his aim as follows:

Philosophers have been prepared to attach considerable theoretical importance to recognitional capacities in their accounts of what it is for a subject to have an Idea of a property, or kind, of particulars, while relegating recognitional capacities for particulars to a theoretically insignificant position in their account of what it is for a subject to have an Idea of a particular; it is the aim of the present chapter to redress the balance (Evans, 1982, p. 270).

Particularly relevant to the framing of the current paper, which considers what we should say about the cognitive capacities of animals, Evans also writes a few pages later:

⁹ McDowell does not comment on how this is supposed to apply to singular thoughts based on episodic memory (and indeed objectual memory in Openshaw's sense), as obviously any individuals remembered might have changed beyond recognition in the meantime. As James Openshaw has reminded me, this is an issue on which Evans himself (1982, p. 272 f.) does offer some comments— roughly, to the effect that a *past* possession of a recognitional ability is sufficient to underwrite the relevant singular thoughts— but also ones that are not obviously compatible with what he says elsewhere (ibid., p. 116), when he insists that the concept of discriminating knowledge "is one of a *capacity*, and [...] its being possessed at a given time must surely reside in facts about what the subject can or cannot do at that time". See Openshaw (2018) for further discussion.

¹⁰ What exactly Evans thought about demonstrative identification, and whether he was right, has been subject to rather involved and somewhat acrimonious discussion (see especially McDowell, 1990; Peacocke, 1991). Rather than rehearse some of the intricacies of that debate (for critical discussion, see also Fortney, 2022), my key aim in what follows is to focus on what I have called the Temporal Reasoning Condition, which has been largely neglected (or simply taken for granted) in it.

¹¹ See also the following: "[T]here is surely a rather important practical difference between someone whose thoughts about an object rest solely upon a recognitional capacity and someone whose Idea is only individuating because of some such element as 'which I met' or 'which I observed'" (Evans, 1982, p. 283).

Most organisms have at least a rudimentary capacity to recognize at least some among the other members of their own species, if only their parents and offspring; and since so much of an organism's welfare (especially among the social animals) is dependent upon successful interrelation with other members of its species, we should expect to find an informational system [...] developing out of this primitive capacity as early as any other (Evans, 1982, p. 276).

Yet, there are grounds for agreeing with McDowell's implied view that Evans' reasoning on these issues, as presented in *The Varieties of Reference*, is somewhat inchoate. They come out in particular when we consider the extent to which Evans does or does not endorse the Temporal Reasoning Condition on memory-based singular thought. There are at least two reasons why Evans' discussion might be deemed unsatisfactory on this issue— one to do with his framing of the explanatory target, the other to do with ambiguities in the concept of recognition, and associated questions about the explanatory role it might play in the context of questions about singular thought.

The first reason has to do with the fact that Evans does not draw a clear distinction, of the kind alluded to above, between memory-based thoughts about particular objects that are past-tensed versus ones that are present-tensed. In assessing whether the Temporal Reasoning Condition holds, this is of course an important confound. Temporal reasoning might be trivially involved in certain kinds of singular thoughts because they may be about what was the case with a particular object in the past. One of Evans' (1982, p. 279) central examples, for instance, is of an individual thinking of a particular sheep that it coughed. In this example, the individual may in fact be thinking about the sheep in a present-tensed way— e.g., wondering where it is— but think of the sheep in terms of a particular property that it is represented as having possessed in the past. As such, this example would not necessarily tell us very much about whether the capacity of past-tensed thought is a requirement for memory-based singular thought as such.

The second reason, as I said, has to do with the supposed explanatory role that the notion of a recognitional capacity plays in Evans' account. Although they are made in a somewhat different context, we might use some remarks by Stanley Munsat to illustrate what the issue here is.¹² Drawing a contrast between saying that his dog remembers him in his absence and that the dog *will* remember him upon being reunited with him, Munsat writes,

If I am on the way to the kennel to pick up my dog who has been there for, say, several months, I may wonder whether he will remember me— not whether he *does*, but whether he *will*. In another case, my wife might write to me and say 'The dog remembers you— he waits for you to come home every night' (Munsat, 1967, p. 74).

¹² The context for Munsat's discussion is actually a claim made by Malcolm (1963, p. 210), according to which remembering an object or a person is logically dependent on remembering facts about that object or person. Munsat's own position seems to be that animal memory does constitute a counterexample of a sort to this claim; yet on the other hand he goes on to argue that human's capacity to remember an object or a person is of a quite different type, and that Malcolm's claim still holds true of the latter.

Munsat's point here is made in terms of a difference between two different uses of the word 'remember', but I think it also bears on the significance of the notion of recognition, as used by Evans. Indeed, Munsat could plausibly have phrased what he means by saying that the dog *will* remember him after the (rather long!) confinement to the kennel also by saying that the dog will recognize him.¹³ By contrast, as he goes on to suggest, what is at issue when his wife writes that the dog remembers him is more than just the fact that it will remember/recognize him when reunited with him. This is because the latter is not sufficient to establish that he has figured in the dog's thoughts in the meantime. The claim would perhaps not be quite as stark as Schopenhauer's implication that animals are mere stimulus-response creatures, but it would still imply a version of the idea that animals are restricted to thinking about both what is temporally present to them as well as what is perceptually present to them.

I believe what this shows is that, when it comes to the question as to whether an individual can have singular thoughts about an object in the absence of that object being in its perceptual range (perhaps, as I have suggested, even in the absence of being able to entertain thoughts about past times at which this object was encountered), the notion of a recognitional capacity is not the right one to focus on. To be sure, recognizing an object might be one important way in which an individual might *manifest* that they have formed a lasting ability to entertain singular thoughts about that object, but in terms of explanation, what we are really looking for is an account of what Evans himself would call the 'informational system' that underpins this capacity for recognition (and perhaps others), and the distinctive properties of that informational system. This is the issue I will turn to now.

5 Temporal reasoning vs. temporal updating

The central question I want to focus on, then, is whether animals might have an 'informational system' (to use Evans' words) that can support singular thoughts about items not currently within their sensory range, even if (as I have assumed) they do not have the same abilities to think about the past and future as humans do. Schopenhauer's words suggest that, if their cognitive lives are confined to the temporal present, this also means that they are restricted to reacting to items that are present to their senses.

To clarify the issues at stake here, it might be useful to bring in the example of yet another dog from the philosophical literature. It makes a brief appearance in Jonathan Bennett's (1964) *Rationality*, and is later given a more extended starring role in an article by Peter Smith (1982).¹⁴

¹³ At one point, Munsat seems to suggest as much himself: "it is quite a different matter for a person to remember someone and for a dog to remember someone. It is not enough for a person to show *recognition* to say that he remembers someone. But it is enough (what else could there be?) for the dog" (Munsat, 1967, p. 73). It is not quite clear how this matches up with the second half of the passage quoted above.

¹⁴ The relationship between Smith's and Bennett's discussion is somewhat complicated, as Smith actually responds to some passages in Bennett's (1976) *Linguistic Behaviour*, in which the latter retracts some of the claims that the example of the dog in *Rationality* was meant to illustrate. Smith argues that in fact Bennett's original conclusions were correct. These intricacies don't matter for the present discussion.

Bennett's example is that of a dog burying a bone, and later retrieving it. His question is whether, observing this behaviour, we should credit the dog with a past tense belief about the earlier burying of the bone. Bennett's claim is that we should not, on the grounds that "there is no non-linguistic way of manifesting knowledge of just some fact about one's past: the dog's retrieval of the bone [at best] manifests, apart from its desire for a bone, two things at once: its belief that it buried the bone in that place, and its belief that in general buried bones stay put" (Bennett, 1964, p. 88). Yet, he goes on to argue, if there is no way for the dog to manifest each of these beliefs in isolation, there are no grounds for crediting it with two such separable beliefs.

Smith broadly agrees with Bennett's conclusion (although he disagrees with his argument for it). However, more importantly, he also gives an account of how we should think of the correct explanation of the dog's behaviour if not in terms of the combination of a belief about the past and a general belief. He writes:

Yesterday the dog buried the bone, and as a result acquired then the present-tense belief which we could at the time express as (roughly) 'there is a bone under the tree, now'. And this belief *persists*: in other words, the dog continues through time to have a *present-tense* belief which at any point could be expressed in the same way. Or perhaps the belief itself does not persist, but rather the dog continues to have a *disposition* to have the activated belief that there is a bone under the tree, which will be triggered by e.g. perception of the location (Smith, 1982, p. 433).

As he also puts it,

Where [one type of explanation] would explain present behaviour by reference to a past belief combined with a general belief, the undercutting explanation would posit a past acquisition of a particular present-tense belief (or disposition to have a present-tense belief) and refer to the general propensity of states to persist over time (ibid., p. 434).

What Smith is describing here is an explanation of the dog's behaviour that credits it only with capacities for what Teresa McCormack and I have referred to as *temporal updating*, rather than capacities for *temporal reasoning* (Hoerl & McCormack, 2019a). In Smith's terms, the only beliefs a creature capable solely of temporal updating can entertain are present-tensed ones— it only ever operates with a model of the world as it is at present.¹⁵ As it receives new information, it updates this model of the world, but crucially it does not retain any information that the world was previously different. Thus, the creature originally represents things as being one way, and it subsequently represents things as being another way, but the second representation simply replaces the first. As we put it in Hoerl and McCormack (2019a, p. 2),

¹⁵ Although I will be going along with this way of putting things for present purposes, perhaps a better way of characterising the relevant beliefs is as being *untensed*. Even calling them present-tensed suggests that there is a feature of the *content* of the relevant beliefs that determines the time they apply to, whereas the idea is that they concern a particular time not in virtue of a feature of their content, but in virtue of it being the time when they are entertained.

the creature “deals with changing input by *changing representations*, rather than by *representing change*.”

We can find a precursor of this idea already in some brief remarks made by William James in his *Principles of Psychology*. There James at one point considers the following idea:

If the constitution of consciousness were that of a string of bead-like sensations and images, all separate, “we never could have any knowledge except that of the present instant. [...]”. We might, nevertheless, under these circumstances, act in a rational way, provided the mechanism which produced our trains of images produced them in a rational order (James, 1890, p. 605).¹⁶

Setting aside some of the framing in terms of ‘images’, what is crucial to understanding the idea of temporal updating is the thought that James might be seen as getting at in his second sentence, about rational action being possible even in a creature without a notion of time, as long as the “the mechanism which produce[s] [its] trains of images produce[s] them in a rational order”. Even a creature capable only of temporal updating will maintain a correct model of the world over time, as long as the order in which it receives information about events in the world matches the order in which those events happen.¹⁷ Furthermore, individual elements in that model might be governed by processes that, e.g., determine how long they persist over time— Smith, for instance, talks about there being a plausible difference between how long the dog’s belief about the bone persists, versus its belief about a rabbit it has seen going a rabbit hole (see Hoerl & McCormack, 2019a, for more detailed discussion, also about the nature of the possible mechanisms involved). Crucially, though, the output of these processes only determines the instantiation of the relevant beliefs over time, rather than entering into their contents. Thus, under certain conditions, the temporal dynamics of cognition itself can substitute for the need to represent temporal relations in the world. In this way, even cognition that is confined to the present moment in time can nevertheless produce quite sophisticated-looking forms of behaviour over time.

It should now be clear why I framed the central issue of this paper in terms of the question whether memory-based singular thought necessarily meets the Temporal Reasoning Condition. Temporal reasoning, in contrast to mere temporal updating, involves possession of a concept of time as a dimension in which different events or states of affairs can obtain at different temporal locations, and the ability to use tense to mark the distinctions between such different locations in time. If memory-based singular thought has to involve a grasp of the idea that the object thought about has been encountered in the past, it requires an ability to engage in temporal reasoning.

The idea of a temporal updating system, by contrast, provides a model for an informational system (in Evans’ terms) that is more primitive in that the representations it involves lack a temporal dimension. Crucially for our present purposes, though,

¹⁶ The embedded quotation in James’ first sentence is taken from Mill (1878, p. 318).

¹⁷ For some evidence that young children, for instance, have difficulties in situations in which this is not the case— suggesting that they tend to rely on mere temporal updating— see, McCormack and Hoerl (2005, 2007).

it does so in a way that does not prejudge the question as to whether the Temporal Reasoning Condition on memory-based singular thought holds. As Smith also points out, in undercutting an explanation of animal behaviour in terms of beliefs about the past and general beliefs, and instead accounting for it only in terms of present-tensed beliefs, “we carry over into the new story all the unity and predictive power that comes from bringing the animal’s behaviour under the web of intentional explanatory concepts” (Smith, 1982, p. 435). That is, we can still explain its behaviour in terms of beliefs and desires, save for the absence of tensed ones.

Against the background of the assumption that animals are only capable of temporal updating, I will now consider the question as to whether there might be good evidence that their beliefs and desires can nevertheless include singular thoughts about objects that are outside their current perceptual range.

6 A concrete example

By way of introducing this section, let me point out one aspect of Smith’s discussion of the example of the dog and the bone that I have not yet commented on. Instead of offering up just one explanatory hypothesis supposedly in line with his explanatory ‘undercutting strategy’, Smith in fact outlines two different ones. Here is the relevant passage again:

[T]he dog continues through time to have a *present-tense* belief [‘there is a bone under the tree, now’] which at any point could be expressed in the same way. Or perhaps the belief itself does not persist, but rather the dog continues to have a *disposition* to have the activated belief that there is a bone under the tree, which will be triggered by e.g. perception of the location (Smith, 1982, 433).

Smith does not comment further on the distinction, or on how one might decide which of the two hypotheses is true. However, in light of the above discussion of Munsat’s distinction between the claim ‘the dog remembers you’ and the claim ‘the dog *will* remember/recognize you’ one might take it to be of some significance. In particular, one worry one might have is that ascribing to the dog a mere disposition to have the belief ‘there is a bone under the tree, now’ when confronted with the relevant perceptual scene is very difficult to differentiate from crediting it with a mere recognitional capacity for behavioural opportunities afforded by that scene. Arguably, we would be on much safer ground in crediting it with beliefs about the buried bone if there was also some way of manifesting them that did not rely on actually being confronted with the scene under the tree again.

I will now turn to an empirical study which might be seen to bear on this issue— it involves ravens rather than dogs. The example I will focus on is a study by Kabadayi and Osvath (2017), who examined tool-saving behaviour in ravens. In this study, ravens, who have independently been shown to be very good at using tools to get a reward, first learn that a certain tool— a stone— can open an apparatus containing a food reward. The following day, they are re-introduced to the baited apparatus, but now the tool to open it is not available, and the apparatus is removed after a while.

One hour later, and at a different location, the ravens are offered a forced choice selection between the functional tool and three non-functional distractors. It was observed that the ravens selected the functional tool, and did so already on the first test trial of this kind.

Tool-saving behaviour is sometimes construed as a measure of ‘episodic future thinking’, i.e., the capacity to anticipate future events. As such, it would be a manifestation of temporal reasoning. However, it is not clear why performance in this task should require an ability to distinguish between past, present and future times, and could not be achieved on the basis of mere temporal updating abilities (for a more detailed defense of this claim see Hoerl & McCormack, 2019a; see also McCormack & Hoerl, 2011).

For present purposes, I think a more interesting question about this study concerns its potential to tell us something about animals’ abilities to think about *objects*. Consider, for instance, the ability to form stimulus-response associations, or the ability to recognize an object when perceptually presented with it, and in doing so draw on information about the object acquired in the past. The object the ravens are presented with when they have to make their forced choice is the stone, and Kabadayi and Osvath (2017) are quite careful in trying to rule out alternative explanations for their choice behaviour that just focus on properties that may have become associated with the stone.

Thus, for instance, it may be thought that the past history of opening the apparatus with the stone might have led the ravens to transfer some value simply to having the stone. In that case, however, one might expect that value, in the absence of the apparatus, to be outweighed by that of other, more directly rewarding objects. Therefore, Kabadayi and Osvath also included trials in which, at the forced choice stage, the ravens were offered a smaller immediate food reward as an alternative for selecting the tool. Even in those trials, they found, the ravens picked the tool. Similarly, by choosing a stone as the relevant tool in this study, Kabadayi and Osvath chose an object of a type that the ravens will have come across in many other circumstances in which it was not of any particular instrumental value. Thus, their behaviour cannot be explained in terms of a choice of an object that is of general use.

Perhaps unsurprisingly, other researchers have nevertheless queried some of the claims Kabadayi and Osvath have made about the cognitive capacities revealed in their experiment.¹⁸ In part, these debates can be seen to turn on general questions about how best to navigate the spectrum between an overly strict application of ‘Morgan’s Canon’ and an overly liberal interpretation of animal behaviour— questions which go beyond the scope of the present paper (for discussion, see, e.g., Andrews & Monsó, 2021; Buckner, 2013; Steward, 2018). For my purposes, the more specific issue is that we also need to be careful about the precise hypothesis about animal cognition that is in question.

Consider, for instance, Redshaw et al. (2017), who argue that further experimental manipulations might be needed in order to bolster the case against an associative explanation of Kabadayi and Osvath’s findings (see also Hampton, 2019). One proposal Redshaw et al. (2017, p. 821) mention is to visibly destroy the reward apparatus

¹⁸ I am grateful to an anonymous reviewer for prompting me to comment on some of this literature.

and check whether the ravens still prefer the functional tool. I agree that a change in the raven's behaviour under such a circumstance would make even more compelling the idea they were thinking about the absent apparatus when selecting the tool in Kabadayi and Osvath's original study. Whether it would equally make it more compelling that they possess capacities to engage in reasoning about other times is far less clear.

To put the point differently, Redshaw et al.'s mooted associationist explanation goes beyond the type of potential undercutting explanation for the case of temporal cognition that I have outlined in Sect. 5, and undercuts as well any claims about a capacity for singular thought.¹⁹ Arguably, any thought that the two types of undercutting explanations have to stand or fall together involves the very assumption at stake in the question as to whether or not memory-based singular thought must meet the Temporal Reasoning Condition. As such, even if experimental manipulations such as those suggested by Redshaw et al. turn out to bolster the case that, in selecting the stone, the ravens are thinking about the baited apparatus, despite it being absent from their current perceptual environment, further argument (and empirical evidence) would be required to support the idea that, in doing so, they also recruit a capacity for temporal reasoning, rather than just temporal updating.

7 Coda: human memory-based singular thought and temporal reasoning

I cannot pretend to have shown conclusively that the ravens in Kabadayi and Osvath's experiment can have memory-based singular thoughts without meeting the Temporal Reasoning Condition, but I hope at least to have given at least some grounds for thinking that the two might not necessarily have to go together. In closing, I want to briefly consider an obvious follow-on question.

At the beginning of this paper, I said that I would focus on the case of singular thought in animals for largely methodological reasons, because it might help us set aside McDowell's observation that self-conscious human beings, at any rate, are plausibly capable of thinking of any particular that they can entertain a memory-based singular thought about as *ipso facto* one that they have previously encountered—perhaps independently of whether their doing so is strictly speaking necessary for having the relevant singular thought in the first place.

However, one might ask whether elements of the considerations I have raised regarding the representational abilities of animals also carry over to humans. As I mentioned, it is plausible to think that humans, too, often have present-tensed thoughts about objects not currently in their perceptual range. One possibility is that these are in fact always backed up by other thoughts that meet the Temporal Reasoning Condition, i.e., thoughts about the object as having been encountered in the past. However, if what I have said in this paper is at least roughly along the right lines,

¹⁹ We are, in other words, back in the territory of Schopenhauer's (2009, p. 56) view that animals can only respond to what "lie[s] before their own restricted field of vision and faculty of apprehension".

it raises the question as to whether this over-intellectualizes at least some of the relevant thoughts.

John Campbell (2001, p. 90), for instance, suggests in a discussion of the clinical Capgras syndrome, in which individuals claim that another person— typically their spouse— has been replaced by an impostor, that the delusional belief takes, e.g., the form “That [currently perceived] woman is not that [remembered] woman”. Campbell does not go into much detail about how exactly the latter memory demonstrative is meant to be construed,²⁰ but mentions that a canonical way of verifying statements involving such a demonstrative would be by attempting to engage the relevant person in joint reminiscing to look for whether one’s memories coincide with theirs.

Whatever the specific issues at stake in the case of Capgras syndrome, I think it is at least arguable that, in an ordinary situation in which one’s wife is, for instance, working in the room next door, one’s thought about her need not take the sophisticated form of a memory demonstrative in the sense understood by Campbell.²¹ Shared memories are of course something humans value in a relationship, and that perhaps make the relationship valuable, but some more argument seems to be required to establish that they come into play even if my current concern is, for instance, just whether my wife in the room next door might like a cup of tea.

When considering the relationship between memory-based singular thought and temporal reasoning in human cognition, a danger of over-intellectualising arises not just from the fact that humans are self-conscious creatures who necessarily have “the idea of [themselves] as having traced some definite part of the world” (McDowell in Evans, 1982, p. 299). A temptation to assume that memory-based singular thought about an object necessarily has to include thought about the object as one that one has encountered in the past arguably also arises more specifically because such objects often feature in humans’ thought primarily as an object of contemplation, especially in the context of memory-based singular thoughts that are past-tensed. In this paper, by contrast, I have highlighted that memory-based singular thoughts also often come in a present-tensed variety, and arguably at least sometimes in this context a key role they play is to keep available their object as a target for potential action.²² The question whether, on occasions where this is their primary role, the representational abilities that underpin them must include the idea of the object as having been encountered in the past is at least non-trivial.

²⁰ Most plausibly, the idea would probably be of a demonstrative underwritten by objectual memory in Openshaw’s sense (2022), rather than necessarily individual episodic memories.

²¹ One way to think of this is in terms of the idea that the more basic temporal updating system, which we discussed in the case of animals, is in fact still present in humans, too, alongside the capacity to engage in temporal reasoning— as suggested in Hoerl and McCormack (2019a). Potentially relevant in this context is also the fact that Capgras patients are often somewhat unperturbed by the fact that the person they otherwise regard as an impostor shares a house with and looks after them.

²² Influential discussions of the role of singular thought in action explanation include Perry (1979, focusing primarily on indexicals) and Peacocke (1981, focusing primarily on perceptual demonstratives). Part of the thought here is that some of the general considerations they put forward generalise to the case of memory-based singular thoughts. A more systematic discussion of the relevant parallels (and differences) will have to await another occasion, though.

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