A Minimalist Approach to the Development of Episodic Memory

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Abstract: Episodic memory is usually regarded in a Conceptualist light, in the sense of its being dependent upon the grasp of concepts directly relevant to the act of episodic recollection itself, such as a concept of past times and of the self as an experiencer. Given this view, its development is typically timed as being in the early school-age years (Perner, 2001; Tulving, 2005). We present a minimalist, Non-Conceptualist approach in opposition to this view, but one that also exists in clear contrast to the kind of minimalism ('episodic-like') espoused by Clayton and Dickinson (1998) with regard to memory in food-caching birds. While emphasising the nonconceptual elements of episodic memory (in common with the 'episodic-like' approach) we also insist on the essentially phenomenological nature of the memory (as does the Conceptualist approach). We propose the third year of life as a plausible onset period. Our view is rooted in Kantian assumptions about the spatiotemporal content of experience (and thus of re-experience) and about the synthetic unity of experience—and thus of re-experience. We answer two objections to this position.

In this article we articulate and defend a view of episodic memory that is an alternative to the two dominant approaches to this kind of memory present in the psychological literature. One of these views ascribes rich conceptual capacities to the individual, is associated with the work of Endel Tulving (e.g. 2005) and of Josef Perner (e.g. Perner, Kloo and Stöttinger, 2007), and is applicable to adults and to school-age children. The other is both minimalist and Non-Conceptualist, is associated with the work of Nicola Clayton and Anthony Dickinson (1998), and is applicable to animals. Our view is, like the latter, a minimalist and Non-Conceptualist position but is also, like the former, directed at capturing a form of experience—a phenomenology—not only a level of information pick-up. It is applicable to young, pre-school children. We leave open the question of its relevance to animal cognition; though see Clayton and Russell (2009) for some first moves. We put together our case from philosophical materials, exclusively Kantian ones, but we also illustrate its field of application by reference to an exploratory study of deferred imitation in pre-school children. Our aim is not only to reflect on the possibility of a certain form of memory, but also to set out a position with clear empirical 'cash value'.

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In the second half of the article we defend minimalism against two kinds of objection: (1) that an approach of this kind has neither the resources to explain how the minimally episodic individual can locate particular conscious memories in her past, nor the resources to explain the linkages (both philosophical and neuroscientific) between episodic memory and a non-egocentric, environment-centred representation of space; (2) that the way in which the minimalist approach puts the notion of memory-as-re-experience to work is misconceived, because (a) re-experience must be treated as a *meta*representational (and therefore conceptual) achievement and (b) because the term 'representation' can replace the term 're-experience'.

1. Two Views of Episodic Memory: Conceptualist versus Minimalist

In Conceptualist theories of episodic memory, it is claimed that episodic memory is not possible unless concepts of a particular kind are employed in the act of recollection. This is the position that has been developed over the years by Endel Tulving, who had coined the term 'episodic memory', contrasting it with semantic memory, nearly forty years ago (Tulving, 1972). On this view, the recollector does not merely undergo the re-experience of an event or encounter, but she knows something about her re-experience, conceptualising it as such. Thus, in Wheeler, Stuss and Tulving (1997) episodic memory is described in terms of the particular kind of epistemic awareness implicated in it—*autonoetic,* or self-knowing, consciousness. This is 'the ability to mentally represent and become aware of [one's] experiences in subjective time' (p. 349). In one of the more recent statements of his position, Tulving (2005) has emphasised the commonality between re-experiencing the past and pre-experiencing the future, together with the ability to travel mentally from the present towards each of them (so-called 'mental time travel'; on which see Suddendorf and Corballis, 2007).

Tulving's position can be closely allied to that of Josef Perner (e.g. 2001). According to Perner, the recollector does not merely represent an experienced encounter with the world, but recollects the episode as the personally-experienced cause of her present mental state. To do this, the recollector must be able to conceptualise the mental state she was in on that earlier occasion. This position, and the evidence for it, will be examined when we answer the second objection. A third Conceptualist view of episodic recall is owing to the philosopher John Campbell (1994, 1997, 2002), in which it is the concept of temporal sequence that is implicated. This position will be addressed in the context of the first objection.

Tulving's original definition of episodic memory can be construed in a minimalist and Non-Conceptualist light. In his landmark paper he wrote: 'Episodic memory receives and stores information about temporally dated episodes or events, and temporal-spatial relations among these events' (Tulving, 1972, p. 385). Clayton and Dickinson (1998) have taken this sentence to mean that so long as a creature can recall *what* happened (or was the case), *where* and it happened, and *when* it happened (WWW henceforth) it is utilizing episodic memory. According to these

authors, the food-retrieval performances of the scrub-jay (a food-caching bird) meet these requirements, with 'What' referring to the kind of food cached ('wax worms'—larvae—versus peanuts, or another less preferred food), 'Where' meaning the location of the cache as defined by landmark cues, and When meaning how long ago the food type was cached. To consider 'When' in more detail, the birds refrained from re-visiting locations in which the preferred wax worms had been cached if the delay between caching and search was too long, because they had learned that the food decayed over a long interval. Instead, they would visit the location in which the less preferred but longer-lasting food (the peanuts) had been cached, after the long interval. After a shorter interval however, they would return to the wax worms. Analogous abilities have been reported in the rat (Babb and Crystal, 2006).

In interpreting the birds' abilities, Clayton and Dickson hedge somewhat over their status by calling the memory performance 'episodic-like', on the grounds that the animals cannot be interrogated about their experiences. In contrast to the Conceptualist positions, then, not only do Clayton and Dickinson not explain the birds' memory in terms of the concepts they possess but they make no claim about the phenomenological content of the birds' recollections.

2. Negative and Positive Reasons for Introducing a Third View—a New Minimalism

While we agree that the Conceptualist accounts of episodic memory can capture what it is like for adults and older children to cast their minds back to episodes in their lives so as to re-experience them, we deny that this is the only possible kind of episodic memory. We will argue that episodic memory in humans can require little in the way of a conceptual grasp of experience itself, of the causation of current knowledge by past experience, and of an objective temporal sequence.

The Clayton-Dickinson minimalist perspective on episodic memory does not, however, seem to have the resources to be a plausible alternative to Conceptualism. In the first place, in opting for the term 'episodic-like' these authors are implicitly denying that non-verbal procedures can tell us anything about the phenomenal content of memory. We will argue, in contrast, that purely behavioural data can indeed serve as evidence for underlying phenomenology. Indeed, to refuse to make claims about phenomenal content ensures that one is doing no more than defending the view that birds show *event* memory of a certain kind, not episodic memory of any kind. Second, the much-discussed Tulving thesis yields interpretations that are at least as plausible as the Clayton-Dickinson WWW interpretation. Accordingly, 'temporally dated' can be taken to mean, 'having a particular or unique locus in time', rather than meaning 'defined by its distance from the present'. Moreover, 'temporal-spatial relations among these events' could be taken to refer to spatiotemporal relations *within* an episode rather than the 'temporal' meaning

'distance from present time'. It will emerge that this latter possibility marks the main divergence between Clayton and Dickinson's minimalism and our own variety.

The third difficulty with the Clayton-Dickinson version of minimalism arises from the fact that knowledge of how long ago the recollected event took place would seem to have no *constitutive* role to pay the episodic status of the memory. Not only is it possible, of course, for one to know precisely how long ago an autobiographical event took place and yet have no conscious memory of its happening, it is also possible, though rare, for one to re-experience an event memorially but have no robust knowledge of how long ago it happened. We do tend to know about distance from the present in episodic memory, but in a case in which we did not, and in which we had a recollective experience of the event, plus the knowledge that it took place *some* time in our past, no conceptual considerations would seem to prevent one from thinking of the memory as being episodic. The view we shall develop is that as long as the phenomenal content of the memory is of a certain kind (to be explicated) and as long as one knows that the memory is of a *completed* event—i.e. that the memory is of something that has already happened—then there is no significant impediment to the claim that it is an episodic memory.

We now turn to our positive thesis. According to our version of minimalism, if an episodic memory is indeed a form of re-experience then it must inherit what is essential for something to be an experience at all. It must inherit two things from the original experience: its spatiotemporal content and its 'synthetic unity'. In the first place, the objects and actions within the original episode (the semantic 'Whats') will have spatial locations relative to the individual and they will have a temporal character bound to these (simultaneous, or successive). In the second place, the spatiotemporal and semantic elements of the encounter must be synthesised within a single consciousness if there is to be any experience—and thus a re-experiential memory—of the encounter. This is not to claim, however, that the individual must be reflectively self-aware of her experience (as in Conceptualism), but only that the flux of perceptual input must be unified at one egocentric point. These are clearly 'transcendental' conditions for experience, meaning that they are a priori conditions rather than empirical characteristics that experiences do possess in fact.

These considerations are obviously Kantian ones. We shall now explicate them before showing how they can be applied within a specific developmental task.

3. The Kantian Context of a New Minimalism

3.1 The Spatiotemporal Conditions

What we have been alluding to is the Kantian 'a priori' of space and time, as expressed in the Transcendental Aesthetic section of *Critique of Pure Reason*. For Kant, spatial and temporal content is not something derived from experience, or something that it is possible for experience to be enjoyed without, but it is that on

which experience depends as a necessary framework. Spatiotemporal content is not merely contingently present in experience.

In Kant's words:

> Space is not an empirical concept that has been drawn from outer experiences. For in order for certain sensations to be referred to something outside me (i.e. something in another place in space from that in which I find myself), thus in order for me to represent them as outside one another, thus not merely as different but as in different places, the representation of space must already be their ground (Kant, 1781/1998, A23/B38, p. 157).

It is evident here that the kind of space Kant had in mind was not Newtonian absolute space or allocentric 'landmark' space, but space as it is experienced from an egocentric point of view. This is also clear from the following: 'Considering the things which exist outside ourselves: it is only in so far as they stand in relation to ourselves that we have any cognition of them by means of our senses at all' (Kant, 1770/1992, p. 366).

The considerations regarding time parallel those of space. While micro-events within an episode have spatial relations to one another, they also have temporal relations: they can be simultaneous or not, and, if not, one will be earlier or later than another:

> Time is not an empirical concept that is somehow drawn from an experience. For simultaneity and succession would not themselves come into perception if the representation of time did not ground them *a priori*. Only under its presupposition can one represent that several things exist at one and the same time (simultaneously) or in different times (successively) (Kant, 1781/1998, A31/B46, p. 162).

Kant fielded a number of arguments in support of these claims, and it would go beyond the bounds of this article to discuss how successful they are (Guyer, 2007, ch. 2, for a recent survey). But we will say, in defence of our proposing such a philosophical framework, that a general psychological account of episodic memory will rest on one set of philosophical assumptions or another; and it is better to be explicit about what framework is being employed. Moreover, our defence of the present position will not involve a further defence of arguments contained in the Transcendental Aesthetic, which will be treated as a kind of bedrock.

These spatiotemporal necessities may be described as 'perspectival', in the following sense:[1] just as experience must involve an experiencer's spatial perspective on objects and events, so too must re-experience. Consequently, episodic memory

[1] See Peacocke (2010) for a different yet related use of 'perspectival' in the context on animal consciousness.

will be memory for objects and events from the point of view of the experiencer. Additionally, the temporal element in episodic memory will assimilate this perspectival quality in so far as there must be *binding* of temporal to spatial content if experience and re-experience are to be veridical. For example, I see a red flash on my left followed by a blue flash on my right. It would be a failure of experience and of episodic memory to see and recall the blue flash on my right being followed by the red on my left. In short, while time, in the present context, is not perspectival in itself, when bound to objects and happenings in space it is necessarily so.

3.2 Synthetic Unity

We need first to distinguish between the binding of object features and Kant's notion of the *synthetic unity of apperception*.[2] At a high level of generality these notions are similar (on which see Kitcher, 1990, pp. 84-6), but their differences are also important in the present case. Solving 'the binding problem' is a matter of integrating, putatively by means of 'attention' (Treisman and Gelade, 1980), the features of an object such as its colour, shape, location, and trajectory, given that these features are computed in different parts of the visuo-spatial brain. While binding of this kind is certainly necessary for veridical perception, it cannot be said to be necessary for there being any experience at all. Indeed, experimental participants may experience so-called illusory conjunctions, such as a blue square being red while a red circle next to it is blue, when the information-processing capacities are put under pressure (Treisman and Schmidt, 1982), while brain-damaged individuals may experience such illusory conjunctions in the normal course of life (McCrea, Buxbaum and Coslett, 2006). In these cases the experience is coherent but non-veridical. Similarly, an episodic memory might be coherent, as opposed to fragmented, but not veridical.

What is the central significance of the unity of apperception? Where the spatiotemporal nature of experience was presented in the Transcendental Aesthetic as a bedrock of experience of any kind (as having a certain kind of spatiotemporal ordering) the unity of apperception was introduced in a later section of the *Critique,* the Transcendental Deduction, with the promise of providing some constitutive linkage between a particular form of self-consciousness and experience specifically of an objective world. Thus, Bermúdez (1994): 'Just as events which an individual experiences must take place in a single spatiotemporal order (as argued in the relevant parts of the Transcendental Aesthetic) so too must all the experiences he has of them fall within a single experiential continuum, within a single unified consciousness. ... The unity of apperception depends upon experiences being connected up in such a way as to form a single series' (1994, p. 215). In a famous passage defending the principle of unity Kant began by stating that '[i]t must be

[2] 'By *synthesis*, in its most general sense, I understand the act of putting different representations together, and of grasping what is manifold in them in one cognition' (Kant, 1781/1998, A77/B103).

possible for ''I think'' to accompany all my representations' (Kant, 1791/1998, B132, p. 246) for without the right kind of connectedness converging upon a single individual, or generated (through action) by a single individual, there would be no possibility of ascribing objective experiences to oneself.

How strong is this claim about self-identity? We will briefly survey the options. Following Burmúdez (1994) again, the strongest form of the Kantian claim about unity is that considerations of the kind Kant fields establish that the 'I' in question refers to an enduring, substantial entity. More cautiously—this is Bermúdez's position—the claim is that there needs be at least the *possibility* of all experiences being ascribable to a numerically identical individual. Then there is a weaker claim still, which Bermúdez ascribes to Kitcher (1984, 1990). This shifts the weight of the unity principle away from the question of what can be established about a putative subject of coherent experience and towards the coherence of the representations themselves. The central idea, for Kitcher, here is that, *pace* Hume, the very idea of attributing experiences requires that mental states be interconnected by synthetic relations of 'contentual dependence'[3]: 'we must acknowledge the existence of a thinking self in that we recognise that all representations ... must be regarded as belonging to a contentually interconnected system of mental states' (Kitcher, 1984, p. 118). On this view, which Bermúdez calls the No Ownership position, the unity principle captures no more than the fact that 'I' refers to a set of mental states connected by their contents. With justification, Bermúdez objects that this is a good deal less than we would normally mean by the first-person singular. In fact, both the Bermúdez position and the weaker Kitcher position are useful to the present thesis, as will immediately become evident.

The conceptual and empirical usefulness of the synthetic unity of apperception to a minimalist view of episodic memory can now be set out. In the first place, if something is an accurate episodic memory, then it will not only contain spatiotemporal information bound in the right kind of way to semantic information. In addition, the elements of the representation will (a) be such that they capture the experiences of a single individual either statically or dynamically related to an episode (Bermúdez), while also (b) the contents of the representation are such that they bear a synthetic rather than atomistic relation to one another. The latter implies, to go beyond Kitcher, that recall of some elements will ensure the recall of others. This, in turn, implies that the minimally episodic rememberer will (a) have a representation that could plausibly belong to *somebody*, and (b) that recall will be all-of-a-piece, not bit-by-bit: recalling some elements will hook in others.

Moving to the empirical implications of these conceptual claims, suppose that there is a group of children being tested on a task that requires recall of WWW

[3] 'There is some mental state M3 such that, *ceteris partibus*, the content of M3, and so M3 itself, would not exist or would be different had M1 and M2 had different contents' (Kitcher, 1994, p. 115). Here are two examples of this process. (1) M3—that I am located between A and B; M1—that A is on my left; M2—that B is on my right. Alternatively: (2) M3—that the glass is shattered; M1—that the glass is fragile; M2 that the glass suffers a heavy impact.

elements in the present sense—spatial, temporal order, and semantic. Success on this task will mean binding the semantic to the spatiotemporal elements correctly. What is the role of synthetic unity here? Let us assume that the group is performing at a better-than-chance level on the task. What of the children who *fail* to bind all the WWW elements correctly? If the children are of an age at which episodic memory is possible, then one would expect, on Kitcher's view, there to be vanishingly few children in the group who fall just short of complete binding, recalling, say, two of the Ws but not the third. This is because, being synthetic in the Kitcher sense, recall of a subset of the elements (i.e. spatial plus temporal, or spatial plus semantic, or temporal plus semantic) will bring along with it the other, just as pulling part of tapestry will deliver the whole. We shall present a concrete example of just such a process when the minimalist thesis has been more fully described.

Meanwhile, the picture of episodic recall being sketched here has considerable neuroscientific plausibility. Neural network modelling of the functions of the hippocampus (the brain region most associated with episodic processing) has converged on the view that one of its core functions is that of pattern completion by autoassociation, which entails that, given a sub-set of the input, the network will output the complete pattern (McNaughton and Morris, 1987; Morris and Frey, 1997; Rolls and Treves, 1998).

Finally, note that the kind of synthesis in question is such that it could possibly (Bermúdez) be the experience of a single individual, while the question of *which* individual would surely not arise for the rememberer. According to minimalism, this is one of the nonconceptual conditions for there being recall of self-in-past. This 'self' element does not require the individual to project herself into the past as an experiencer whose experiences 'stay behind' to be reconstituted in the present. Instead, what is minimally required is that something in the present evokes a previous experience with the kind of coherence egocentrically centred on a single individual that renders up the memory 'immediately' (i.e. unmediated by concepts). This supposed immediacy heralds the question of how an essentially nonconceptual experience of pastness could arise, which is the topic of the next section.

3.3 Nonconceptual Content

A WWW memory of the kind just sketched is unlikely to be wholly nonconceptual, given that the What element will be conceptual if the child is identifying an object or action as such. The present proposal is, however, that the spatiotemporal element *is* essentially nonconceptual, in the sense that it is inherently undetermined by our concepts and conceptual capacities alone, while the memorial framework of self-ascription and past-ascription can also be essentially nonconceptual.

It is paradoxical that Kant, the philosopher who examined how the application of conceptual content makes objective judgments possible, the philosopher of conceptual content *par excellence*, is being invoked here in support of the essentially nonconceptual content of experience, and of re-experience. This paradox is only apparent, however, because Kant was also interested in showing how essentially

nonconceptual experience is something that *must be combined with* conceptual abilities in all judgments—which will include judgments about one's autobiographical past (see Hanna, 2005, 2008). In his remark that '[h]e who sees his first tree does not know what he sees' (Kant, 1780/1992) Kant was acknowledging the possible existence of conscious experience that is not conceptually determined. Also, in saying that 'objects can indeed appear to us without necessarily having to be related to functions of the understanding' (Kant, 1781/1998, A89/B122, p. 222) Kant was also acknowledging the possible existence of conscious experience that is not conceptually determined. The fact that the content of an experience is not conceptually determined or even determinable is perfectly consistent with its being *combinable* with conceptual content in a judgement.

The present claim is that while the experience and re-experience of What may indeed have conceptual content, the experience and re-experience of Where and When can lack conceptual content. They may be conceptualised in some cases but this conceptualisation will be something over-and-above their experiential status.

We now present Kant's own example of how the experience of spatial position can be nonconceptual. In experiencing one of my hands as being on my left and the other as being on my right, conceptual content may well be involved (e.g. about handedness and ring wearing). But what might be the purely spatial content of the experience? One can 'purify' this content, in Kant's example, by placing a mirror on the left side of one's right hand, facing it. In this case one will experience an 'incongruent counterpart' (Kant, 1770/1992, p. 370) of my right hand but on my left—an apparent left hand. These two hands, the real and the apparent, are conceptually identical, as they are the same hand, but they are nonconceptually and experientially different. It is a kind of difference that we would necessarily fail to describe to somebody who had never had the experience of objects being on her left-hand side. That the two hands (one real, one a mirror image) are present simultaneously goes to make up the essentially nonconceptual temporal content, bound to the spatial[4].

Similar considerations can be applied to temporal features as have been applied to the spatial features, in the sense that simultaneity and succession are 'given' in perceptual experience, rather than being elements that have to be conceptualised as such. But can the same be said for *re*-experience? There is a clear difference between a temporal sequence of elements in the present and their recollection,

[4] It is important not to throw the Kantian baby out with the Kantian bathwater here. As Peacocke (an advocate of nonconceptual representational content) says, there is some plausibility in McDowell's (a Conceptualist) 'Kantian position' (Peacocke, 2001, p. 261) that 'the objective world is present only to a self-conscious subject, a subject who ascribes experiences to herself . . . It is . . . the power of conceptual thinking that brings both the self and the world into view' (McDowell, 1994, p. 114). But this is, on our view, a plausibility that springs from the case of adult humans. As Peacocke eventually concludes, there are 'primitive' aspects to representational content 'which our subjective experience share with mere animals [that] does not involve the grasp of objectivity required for conceptual content' (Peacocke, 2001, p. 264).

which is that, at recollection, all the elements are in the past, thereby establishing *two* perceptual sequences. For example, if the original order was 'A-B-C' then the elements at recollection are 'A-B-C-present'. Moreover, in memory there is nothing to guarantee that the recollective act will not cause C to be recollected first before A and B. In reply to this concern, we take it to be a fact about the kind of episodic memory under discussion (particularly episodic memories evoked by some object or event in the present; see below) that the temporal sequence of the original episode is *replayed*, not reconstructed. While the recollector may indeed take C as the most recent, B as less recent, and A as the most distant from the present, insofar as the memory is episodic, in our minimal sense, then A-B-C will be the nonconceptual core of the trace. This is an assertion only, but we hope it will emerge as a secure one when we have outlined the sense in which pastness can be given an essentially nonconceptual characterisation.

We will discuss what a *conceptual* grasp of temporal sequences amounts to in the context of the first objection, but what we take to be the core of an essentially nonconceptual experience of pastness is the notion that a past event is unrepeatable and *completed*. One can think of this notion of completion in terms of children having some grasp of the 'aspect' of an event without having a grasp of its tense.[5] The context of this idea is again Kantian, and is to be found in the Transcendental Deduction.

We have seen how Kant described the necessarily temporal aspect of experience in terms of order and simultaneity. In the Analogies section of the Transcendental Deduction, he returned to these two kinds of time relation in order to argue in favour of there being objective and 'necessary' temporal relations. That the general line of argument may not have been successful (on which: Strawson, 1966, pp 136-38) does not prevent the Analogies—the famous Second Analogy in particular—from containing an important doctrine in cognitive psychology.

The central idea of the Second and Third Analogies is that when two objects or portions of a single object (parts of the front elevation of a house in Kant's example) are co-existent in experience then there can be 'order-indifference' (Strawson's term) in the way we have percepts of them. We might, for example, look at the bedroom window and then at the front door, but it could equally well be the other way round. These perceptual sequences are, in Körner's (1955) significantly, though fortuitously, Piagetian terminology *reversible*. When, by contrast, we experience successive objects or successive stages of an object's metamorphosis or motion (a ship sailing downstream in Kant's example) there is no such order-indifference, as we have to experience the order as presented. Perception of successive states has an irreversible order: it is order-dependent.

[5] In linguistics, the 'aspect' of a verb refers to facts about how an event or action is to be viewed with respect to its duration, rather than with respect to its actual location along a time-line. For example, *I played* (discrete or perfective aspect) versus *I was playing* (continuous or imperfective aspect). Aspect generally does include tense, but developmentally, children tend to mark aspect before they mark tense in languages where this is possible, such as Italian (Antinucci and Miller, 1976).

Next, it is a fact about organisms (ones that may be as primitive as fruit flies: Von Holst and Mittelstaedt, 1950/1973; see Gallistel, 1980)—that they possess a neural mechanism, sometimes called 'efference copying', that records whether changes in perceptual input are due to changes in the world or due to changes in the organism's perceptual orientation, by monitoring the launch of actions and predicting their effects on perceptual input.

With such a mechanism in place, the greater the executive control the organism can exert, the richer will become the conversely contrasting experience of sequences that are *not* under its control: those that are irreversible and 'imposed'. In the examples that Kant gave, these reversible and irreversible elements were elements in what might be thought of as single events or encounters. But there would seem to be no reason why this contrast should not be extended over longer time periods in which events follow events. It all depends on where one makes the cut between an element of an event and an event in its own right. For example, in place of Kant's house-viewing versus ship-viewing examples, the contrast might be made in terms of the reversible, or order-indifferent, sequences that occur when getting to work (make coffee, turn on computer, check phone messages) versus the irreversible order in which we experience a day beginning (sunrise, bird-song, noises in the street). An objective (in the sense of *not* being self-determined) order of events over time is thrown into relief—or rather will be thrown into relief in the course of development—against a subjective, self-determined order of events over time.

Consider the case of a young child who has a memory image of three events or event elements, A-B-C. Given the above, she will recall B as either 'determined by me' or as 'determined externally' (say, B is a picture-book which is either oriented towards by the child or shown to the child by mother). She may also recall A as preceding B and C as succeeding it, and she may additionally recall the kind of causal linkages between the three in terms of self-determination or world-determination. She will, then, code what might be called the *causal status* of B. Is this child self-consciously exercising a 'concept of the past'? No. But the child is nevertheless exercising a cognitive and practical appreciation of one event or event-element causing another to take place, with the causal locus being either external or internal.

What does this imply about a possible appreciation of pastness in the young child? In the reversible case, in which agency is exercised, a completed experience is retrievable by acting (e.g. a view of a house-elevation can be enjoyed again). In the case of the irreversible sequence, however, it is not retrievable. For example, if a cat walks across the child's path and into the bushes the event is not only completed but also irretrievable, as it cannot be retrieved unless somebody intervenes in the world.

What is necessary to focus on here is the way in which experiencing the irreversible, order-dependent kind of sequence might ground an appreciation of the fact that sequences of events, or of event elements, can be unidirectional. While this is a feature they share with temporal sequences, our claim is that an appreciation of this kind of world-dependent unidirectionality falls well short of a conceptual appreciation of temporal sequence. It is, then, the observation of dynamic events, set against the active pick-up of non-dynamic scenes, that can present to the developing

child an essentially nonconceptual experience of Time's Arrow—the immediate experience of unidirectionality, containing completed and irretrievable elements.

Before considering objections to this form of minimalism, we will render the claims it makes more concrete by framing them within some recent empirical work from JR's laboratory. Data collected from 1- to 3–year-old children will be described. While children of this age are obviously not exclusively 'nonconceptual' cognizers, they are below the age at which the kind of theory-of-mind abilities sometimes implicated in episodic memory are in place (e.g. Perner, 2001; and see below) and also below the age at which the appreciation that temporal sequences can consist of causally-linked elements (Campbell, 1994; and see below) can be seen to be present (McCormack and Hoerl, 2005; Povinelli *et al*., 1999).

4. Deferred Imitation as a Research Tool for Episodic Minimalism

In tests of deferred imitation, participants are invited to reproduce an action they had seen being performed on a novel object when re-presented with the object some time after the original event. This affords a non-verbal test of WWW binding because one can use this technique to find out whether children can reproduce *What* actions the model performed, *Where* she performed them, and the order in which she performed them (*When*).

Young infants can perform acts of deferred imitation (Meltzoff and Williamson 2010 for a review), and indeed children in the second year of life can re-enact sequences of as many as four actions after a number of months (Bauer *et al*., 2000). However, before one can claim that the children are imitating such sequences by WWW binding, it must be ensured that the WWW associations are not semantically based. That is to say, where something is done and when something is done must not be determinable by the child through recruiting her general knowledge of the world. For example, in studies described in Bauer, 2007 in which infants had to reproduce sequences of actions on objects, while they always had to recall what was done to what things in which order, the spatial element was, more often than not, determined semantically, such as putting the eyes on a toy rabbit, and pretending to feed the rabbit a carrot. Similarly, it is frequently the case in such studies that temporal order was semantically scaffolded in a similar way, such as taking the lid off a cup, putting a bead in it and rattling it. This order is fixed and so all the child has to recall is that a rattle had to be constructed from these materials.

In the study to be discussed (Russell and Davies, in press) the relations between the three Ws could not be scaffolded by knowledge of the world. Children between 1 and 3 years of age had to imitate, after a day, actions (*What*) performed on either side (*Where*) of an object, in a certain order (*When*). The children heard a story about two sailors, Tim and Tom, whose boat had broken down at sea. A rectangular box before the child showed a picture of the two men in their boat. On either side of the box were identical levers. The children were shown that the way to get the boat moving again was to perform two actions in a certain order: for example, pumping

the lever on left, and then lifting the lever on the right. Actions-at-locations and their order were completely balanced across children. The levers afforded each kind of action equally. There were, then, two possible actions (lift/pump), at two possible locations (left/right), in two possible orders (left-right/right-left). The children saw that when these actions were performed the box/'boat' was reactivated, with flashing lights and naval music. Half the children were invited to imitate on the first day but, crucially, the other group of children was only invited to 'get the boat going again' on the subsequent day. They did not imitate at time-1.

Most of the 3-year-olds (more than 70%) perfectly reproduced what actions had been done where and when, and in which order, 24 hours later, even if they had only observed the actions on the first day. Additionally, some of the 2-and-a-half-year-olds were also correct. In fact, 2-and-a-half is a plausible estimate of when children begin to lay down episodic traces, because research has shown that this is the period when infantile amnesia begins to fade (Davis, Gross and Hayne, 2008 for a review). Specifically, adults can recall events, such as the birth of a sibling, if they took place when they were older than 2-and-a-half (Eacott and Crawley, 1998).

But what can support the claim that the children's success here was achieved by episodic recollection—by *binding* WWW information in the present terms—rather than by semantic memory for three items of information? The Kantian notion of the synthetic unity of apperception needs to be recruited to answer this question. As was proposed, whereas semantic memory may be atomistic and punctate, an episodic memory is all-of-a-piece, exemplifying the synthetic unity of which Kant wrote. If a memory is episodic, then there should be 'vanishingly few' (as we put it earlier) children whose success is partial, approaching correctness but falling short. Based on this assumption, a measure called the *coefficient of binding* was devised in order to analyse the binding. This was a measure of the probability of getting a third W correct if a child was correct on the other two[6]. We found that these coefficients were at least 90%, and in the case of being correct on order (When) given correctness on Where and What it was 100%.

While these data are only preliminary, they represent the kind of data that can concretize the issues we have been discussing.

5. Two Objections to the Present Form of Minimalism

5.1 Objection 1

What has been described is indeed a kind of re-experiential memory, but it is not a memory of past episodes*; and so it is not a kind of episodic memory. It is more similar to the having of timeless flash-backs that may or may not cause behaviour.*

[6] In terms of the examples of contentual dependency given in footnote 3, one can think of M3 as being 'Pump on the left first', M1 as being 'First action on left' and M2 as 'First action pumping'.

The essence of this objection is the claim that one cannot refer to children as having 'episodic memories' unless one also ascribes to them a concept of temporal sequence within which these re-experienced episodes are located. Given its nonconceptual nature, minimalism refuses do the latter and therefore the account fails as an account of episodic memory.

The primary philosophical source for this objection would be the work of John Campbell, particularly his *Past, Space, and Self* (1994); and see Campbell (1997, 2002) for related papers. Indeed, if one adopts Campbell's definition of an episodic memory as a 'memory of a past happening conceived as having a particular past time in which it took place' (Campbell, 1994, p. 40) then the minimalist view looks incoherent. To have such a memory the individual must, according to Campbell, be able to utilise an objective temporal framework that is analogous to an objective spatial framework. On this view, just as we locate our various positions in the spatial world by the use of a spatial, mental map so do we locate episodes in memory on a time-line by the use of a temporal map. These maps have in common that they require the individual to understand a kind of 'internal causal connectedness' that is independent of her actions. In the spatial case this refers to the internal causal connectedness of objects, and in the temporal case it refers to the internal causal connectedness of episodes—how what happened at time-2 causally depends upon what happened at time-1. This latter appreciation is something that children can be seen to lack until they are 4 years of age or older (McCormack and Hoerl, 2005; Povinelli *et al.*, 1999). For time, as well as for space, this kind of grasp is one that cannot be reduced to an understanding of how one should act given certain information (or it is 'exhausted by its implications for action'); and so it is objective and non-egocentric in that sense.

It is not necessary to dwell on how Campbell builds up an argument for the necessity of an objective, non-egocentric spatiotemporal framework within episodic memory. We will, however, return to the topic of objective spatial maps, and their role in episodic recollection, when the objection has been answered. We shall do so in the context of spelling out how, if there is any validity in Campbell's analysis (we shall assume there is), the present form of minimalism can justify its emphasis on egocentric space, which is a form of spatial processing that has clear 'implications for action' (e.g. if X is located on my left, then I reach on my left).

We shall deal with this objection in the following way. First, we shall accept that, because the mature episodic recollector can 'cast her mind back' at will to a particular event in the past and re-experience it, we must credit her with the kind of objective temporal framework described by Campbell. To take an example from Campbell, in recollecting 'a walk I used to take last summer' the memory is episodic 'because it exploits one's concept of the past' (Campbell, 1994, p. 40). Indeed it does if it is conceptualised as a memory of what one did last summer. One assumes here that unless such a framework were in place then there would be no ability to recall the walk at will (i.e. without reminders, or props as in the Tim and Tom task, above) and one would not be able to perform the recollection when asked to do so.

Having accepted this, however, two points of defence need to be made. First, more is required of a theory of episodic memory than an account of how it depends upon spatiotemporal concepts. What is additionally required is an account of the phenomenology enjoyed by the re-experiencer; and this is what minimalism provides. In the 'walk-I-used-to-take-last-summer' example this could hardly be counted as an episodic memory unless the individual could recall aspects of the walk in the following kind of way: walking along the beach (What) with the sea on my left (Where) before (When) taking the path to the monument. It is not merely that the walk-recollector is *likely* to have such bound-WWW representations and not merely that, as a fact about our folk psychology, we are unlikely to *credit* the individual with an episodic memory unless micro-episodes of that kind came to mind. It is, rather, that an episodic memory that did not contain any phenomenology of this kind is impossible to conceive. The individual might indeed *know* that he took such a walk because he had forgotten it and was told he had taken it, or he might infer that he must have taken it; but recollection without *any* of the phenomenal content of the kind described in minimalism would not seem to be intelligible.

The present minimalist account is, however, intended to be more than a *supplement* to Conceptualist accounts like Campbell's. This brings us to the second point of defence. The aim here is to justify the claim that children who do not possess the kind of temporal concepts described by Campbell—children below age 4, presumably (McCormack and Hoerl, 2005; Povinelli *et al*., 1999)—may nonetheless have episodic memories ascribed to them. One can do this (a) because these children can be credited with the kind of appreciation of pastness described above in the context of self-determined versus world-determined sequences of perceptual experience, and (b) because, in spite of the fact that these putative episodic memories are not conceptualised as such by the child (i.e. they are not episodic *de dicto*), they can qualify as being memories of episodes in virtue of their being such in fact, or *de re*.[7] That is, a WWW re-experiential memory may indeed have been caused by a particular episode.

Defending (b) is the greater challenge, but (a) is in need of immediate elaboration. Recall that the kind of appreciation of pastness described above was in terms of representing events as *completed*. Applying this to deferred-imitation tasks of the Tim and Tom kind, suppose that a child of 2-and-a-half returns to the laboratory and sees the levered box. On the present position, this might evoke a WWW representation of the experimenter's actions, which will encourage the child to repeat what she saw in order to make the box come to life. For this process to go forward, the child does not need to conceptualise the WWW representation as 'what happened

[7] A belief may be true or false in virtue of the description or label held in mind by the believer, or true or false purely in terms of its reference. Thus 'Oedipus thought his mother was gorgeous' is false *de dicto* but true *de re*. See below for the justification for extending this distinction from belief to memory.

yesterday' or even on a previous day. But it is necessary that the child regard it as something that has happened, as an event that was indeed completed. If the child did not—if it was regarded as the work of the imagination—then the child would have no reason to act.

We now turn to (b). This is the case of children who cannot conceptualise past episodes as such, but whose WWW re-experience is that of a past episode in fact—*de re,* or 'extensionally'. Let us assume that in a deferred-imitation study the procedure was performed only once, so that the event was indeed particular and not generic, and that the child has a re-experiential memory of this. Or we might give more everyday examples of one-off events in the child's life: a policewoman comes into the playgroup one morning, or the child sees a dog run off with a string of sausages. These are not generic happenings—the raw material of 'scripts'—but they are events that cause the child to have a re-experiential memory of the kind described above. For Campbell, such memories do not count as episodic; but according to minimalism they do.

The present claim is that memories that are episodic *de re* only (i.e. not known to be of particular datable episodes by the individual) are the foundational kind of episodic memory and are a necessary developmental precursor to the kinds of episodic recollection described by Campbell. This idea parallels some proposals of Burge (1977) in the domain of belief. Burge holds that *de re* belief is the foundational kind of belief, saying that a *de re* belief 'is a belief whose correct ascription places the believer in an appropriate *nonconceptual, contextual relation* to the objects the belief is about' (p. 346, emphasis added). He cautions that 'nonconceptual' does not imply that no concepts at all are being exercised, only that 'the relation not be merely that of the concepts' being concepts *of* the object—concepts that denote or apply to it' (p. 346, original emphasis). When, for example, an individual's sense organs are affected by the object such as to bring about a belief, this belief is not merely a function of how she represents the object.

Burge illustrates the centrality of this kind of belief with reference to early language development. Because, for Burge, a sufficient condition for a belief's being within a *de re* context is that the linguistic usage be indexical and deictic, we can think of the young child's earliest utterances, utterances that are typically about the here-and-now, as expressing *de re* contexts. What language is doing here is establishing a contextual relation between speaker and object. Indeed the language used may be a very poor guide for a third person wanting to pick out the object. But just as Oedipus may have succeeded *de re* in referring to Jocasta as 'that woman over there to whom I am related only by marriage', so 2-year-old Joe will succeed in his reference *de re* to 'Sam['s] bottles', despite their actually being Rafi's bottles, not Sam's. In the putatively parallel case of minimalist re-experiential memory, the child is related to something with the right kind of *causal linkage*, although it is one that does not depend upon her conceptual abilities—abilities for picking out particular occasions within an objective temporal map.

For the objector, this claim might amount to an admission that WWW re-experiential memories are indeed no more than 'timeless flashbacks'. Moreover she

would say that the parallel with early language development is misplaced because where a young speaker can surely be credited with some appreciation of how words refer to things the minimalist is denying the young rememberer any understanding of how memories refer to particular episodes.

To reply: in the first place we have already—in (a)—given reasons for resisting the idea that these re-experiential memories are 'timeless'. They are memories of something that has happened and is complete. In the second place, the parallel with early language development can, in fact, be extended by claiming that a child whose memory is only episodic *de re* may nonetheless be credited with some grasp of the conditions of its causation, just as the early speaker may have some grasp of how words refer to things.

Let us examine the language-development/memory development parallel in more detail. In the linguistic case, the young child must know something about reference unless we want to say the referential act was blind and reflexive (in fact we know that children much younger than 2 understand something about mislabelling: Koenig and Echols, 2003). The child must know, at some level, what she is doing when speaking. The small boy, in the above example, is not caused to speak by the bottles he sees. However, we do want to say that he can be caused to have a re-experiential memory in virtue of a linkage between a particular event and the re-experience of it. Given this, do we not need to ascribe to the child, in addition her being caused to re-experience a particular event, some appreciation of this causal linkage, paralleling the speaking child's knowledge of reference? What kind of knowledge would this be? According to Hoerl (2001) it is of the following kind: 'the causal understanding involved in episodic memory consists in a grasp of certain spatiotemporal constraints on remembering, that is, of the fact that we *must have been around to witness an event before we can remember it*' (p. 333, emphasis added). Is it possible to credit the child with the knowledge that she is having this WWW memory of something because she was present at a certain place when it happened, and yet withhold from such a child knowledge of temporal episodes in the Campbellian sense?

It *is* possible to accept that Hoerl's characterisation can be applied to minimalist episodic memory while also resisting the inference that it implies a grasp of past-event particularity in the Campbellian sense. The minimally-episodic child may have the necessary appreciation that completed goings-on cause her to have re-experiential representations. She may appreciate, say, that she recalls X because she was in place A recently. But this falls short of having an objective temporal framework within which particular events are causally related. For example, a 2-year-old sits down to tea and her mother asks her if her twin brother washed his hands. The girl has a re-experiential memory of her brother washing his hands on her left in the bathroom (a veridical representation of an event that happened two minutes ago) and says 'Yes'. On the present account, what causes her to say 'Yes' is (a) the phenomenal content of her memory (b) the knowledge that this has happened—it was completed within the current set of goings-on—and (c) some appreciation that she can report on this because she was around to witness it. No

concept of episode particularity needs to be in place. This is because the child need not be said to regard the event as the cause of her memory *by applying the concept of particularity* to it (c.f. the case of early linguistic reference, in which reference is not secured conceptually). Rather, particularity will *emerge* in virtue of the causal role a particular event has *de re*, the structure of the phenomenology, and the child's knowledge that she was in the bathroom with her brother recently.

Finally in this section we turn, as promised, to the question of how one can defend minimalism's emphasis on egocentric spatial representations as against the Campbellian case for objective, environment-centred ones. In the first place, it is necessary to concede that the kind of understanding just ascribed to young recollectors in the above example depends upon their having a grasp of an objective spatial world. That is to say, the importance of environment-centred coding has already been assumed in accepting Hoerl's position ('the causal understanding involved in episodic memory consists in a grasp of certain spatiotemporal constraints on remembering, that is, of the fact that we must have been around to witness an event before we can remember it'). There can be no way of representing 'being in a certain place and experiencing these perceptual sequences (completed)' unless one can represent space as having certain features (e.g. A near B and far from C) which do *not* depend upon the relation between the self-as-perceiver and objects. There must be some notion of 'there' as existing whether I am there or not, and as having certain spatial features.

How can one accept the necessary role in even *de re* episodic memory of environmental spatial coding, while at the same time claiming that the 'Where' in WWW is egocentric? This paradox can be resolved by distinguishing between two senses of the term 'egocentric'. In one sense, it is possible to conceive of a creature—in fact, this was the young infant for Piaget (Piaget and Inhelder, 1956)—which can code locations and objects *only* in terms of their relation to its own body, never in terms of their relations to one another. In the other sense, the egocentric spatial representation entails not only having a perspective—even cameras *have* perspectives—but appreciating that the contents of the percept are perspectival: that they are perspectives on an experience-independent environmental layout. The first might be dubbed 'piagetian-egocentric' and the second 'perspectival-egocentric'.

The following is an example of how perspectival-egocentric representations are necessary to episodic recollection and of how piagetian-egocentric representations undermine the very possibility of episodic recall. Somebody tells us that she recollects seeing the only goal being scored in a football match. She recalls seeing this from behind the net—the ball came towards her—rather than seeing the goal side-on or from behind the scoring player. This is a perspectival representation, of course, but one of a perspective on an objective spatial layout within which she was located at a certain point. Without this, she could not have been recalling it by virtue of being there. Consider, by contrast, what the content of a piagetian-egocentric memory would be. Even if one allows that the individual takes this to be a representation of what happened, she can have no notion of her being *there* to see it happen. This would indeed deserve the appellation 'flash-back'.

This recollected goal-scoring example is of a *de dicto* episodic memory, but much the same can be said of *de re* episodic recall, as we saw with the hand-washing example above. If the little girl in the example had no notion of herself as located in the bathroom beside her brother as two objects in a spatial layout, then she would not be recollecting an event at which she was present. The present contention is that children can be said to be doing this while lacking an objective temporal map analogous to an objective spatial map.

Within a neuroscientific context, the dependence of episodic recollection on the ability to construct environment-centred spatial representations hardly needs to be argued for, given that the hippocampus plays a central role in both (e.g. Maguire, 2001). Moreover, we know that individuals with impairments in episodic memory caused by hippocampal damage are dramatically impaired when they have to construct an environment-centred representation from multiple, viewer-centred inputs (Burgess *et al*., 2001). So, given what has been said above, it is not paradoxical that episodic memory, whose representations are egocentric, and the environment-centred coding of space share—more or less—a neural substrate: there cannot be perspectival-egocentric representations without the latter, environment-centred kind.

In a developmental context, while, as we have mentioned, episodic recollection can be seen to stretch back to about 2-and-a-half-years (Davis, Gross and Hayne, 2008; Eacott and Crawley, 1998), it can also be said that the environment-centred coding is 'what develops' around this period: it is what becomes robust after this age (Nardini, Atkinson and Burgess, 2008; Nardini *et al*., 2006; Ratliff and Newcombe, 2008; Newcombe *et al*., 1998). Newcombe's and colleagues' work suggests that the transition to non-egocentric, environment-centred spatial coding is a highly significant one in the third year of life (Newcombe and Huttenlocher, 1992).

5.2 Objection 2

The way in which the minimalist approach puts the notion of episodic memory-as-'re-experience' to work is misconceived. This is for two reasons: (a) the 're-experience' in 're-experiential memory' is not re-experience of an episode but of the original experience conceptualised as such (hence it is a metarepresentational ability) and (b) there is no warrant in the minimalist account for calling it 're-experiential memory' but only for calling it a 'representation', in which case the Kantian analysis cannot be put to work as we have done.

The meta-representational view of episodic memory has been proposed by Josef Perner. On this view the recollector does not merely represent a past perceptual encounter, but rather she recollects an episode as personally experienced, to do which she needs to conceptualise the mental state she was in on that earlier occasion and also to regard this conceptualised mental state as being responsible for the current experience. Perner has expressed this position with rather different points of evidence in different places (Perner, 1991, 2000, 2001; Perner and Ruffman, 1995; Perner, Kloo and Gornik, 2007). However its essence is succinctly expressed by McCormack and Hoerl (2001) as 'The claim is that in episodic memory one's

current mental state refers not just to a past event but also to one's past experience of that event as the cause of that mental state'[8] (p. 207).

If this view is correct, then episodic memory must be unavailable to children incapable of metarepresentation of the kind tapped by theory-of-mind and cognate tasks, in other words to children under 4 years (Wellman and Liu, 2004). In support of this claim, Perner and his colleagues have shown that there is a significant association, in children between 3 and 6 years, between free-recall abilities (assumed by Tulving, 1985, to be a measure of episodic memory) and performance on tasks which tap the understanding that seeing X leads to knowing X (Perner and Ruffman, 1995), and also between their performance on recall of directly-experienced items (versus indirectly-experienced ones) and their performance on first-person false-belief tasks (Perner, Kloo and Gornik, 2007). Data of this kind are consistent with the claim that some kind of conceptual grasp is at least implicated in children's performance on memory tasks that require them to cast their minds back to previously-experienced materials and enumerate them[9].

We will address these data later, but right now it must be said that the metarepresentational theory has no warrant for claiming that the kind of self-referential ability just described is *necessary* to episodic memory. The metarepresentational awareness described by Perner may indeed be present in some levels of episodic recall, but why must it be a necessary component? As Peacocke (2000, pp. 315-17) says, 'It seems that someone can remember seeing something without the concept of seeing or of experience. In describing the memory as one of seeing, we characterise the episodic memory as one of a certain type, which is phenomenologically different from remembering hearing, remembering tasting, remembering feeling. The memory experience can be one of these distinctive types without the rememberer having the concepts of these types' (p. 315). What is essential is not a metarepresentational ability but the possession of a certain kind of phenomenal record of the kind described above (also to be found in the account of Conway, 2001). Such a first-order memory will be episodic insofar as it is a record of a, say, visual experience and not a record of what one was told or one inferred about the past. Also, with regard to the kind of causal grasp referred to by Perner (e.g. Perner, 2001, pp. 185-8) one can deny that it is necessary, in order to possess episodic memory, to have the right kind of beliefs about how experience leads to knowledge.

In reply, a supporter of the Pernerian view could accept that a metarepresentational grasp is not conceptually necessary for episodic memory but insist that it is

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[8] '. . . it is also necessary to represent the additional fact that *one has seen the word on the list and that, therefore, one knows that the word has appeared on the list*. In other words, one has to represent one's own act of experiencing' (Perner and Ruffman, 1995, p. 517, original emphasis).

[9] Perner's (Perner, Kloo and Stöttinger, 2007) latest statement of his position takes a rather different tack from the one described here, while still being a clearly Conceptualist account: Episodic remembering 'requires the understanding that first-person experience can represent actual events' (p. 253). He reports, in support of this view, that children's performance on mental rotation tasks is a further correlate of the free-recall of directly-experienced pictures.

developmentally necessary. The evidence for this view—it would be argued—is the research by Perner, and by others (e.g. Naito, 2003), of the kind mentioned above which seems to have shown that the conceptual abilities described by Perner support the development of episodic memory. But one can question whether the various tasks that correlate significantly with free recall—these are numerous (see Perner, Kloo and Gornik, 2007, for a review)—demonstrate the existence of something present in the phenomenology of episodic recollection. What may instead be the case, as argued by McCormack and Hoerl (2001, p. 209), is that these tasks measure the presence of meta-memorial abilities (Flavell and Wellman, 1977), abilities that could help the child to generate recall strategies. In similar vein, Clayton and Russell (2009 pp 2337-38) argue that the correlation between free-recall performance and understanding that 'seeing-leads-to-knowing' may be due to the meta-memorial insight that 'if I feel I know this item I must have seen it': a know→see principle. But even if it were possible to show that the correlations with certain metarepresentational abilities reveal something about episodic phenomenology in children above 4 years or so, the conceptual and empirical proposals of minimalism would remain untouched.

The minimalist claim that episodic memory can be a first-order, rather than metarepresentational, re-experience leads naturally to the second form of the objection. If the recollector is simply remembering a seeing event or a hearing event, and so forth, then the individual must still be *representing* this earlier event in some way at time-2. He cannot be literally re-experiencing it, which would amount to little more than a waking dream or hallucination. But if it has to be represented rather than re-experienced then all the Kantian material we have been recruiting in order to say what is necessary to an experience, and therefore to a re-experience, can be jettisoned.

We turn to a discussion of the same kind of issue by Michael Martin (2001), in order to show how this objection does not threaten the present position. Martin sets up the case by giving an 'arch' example of what a *literally* re-experiential memory would be like, in order to bring out what *is* appropriately experiential in episodic memory, and to defend the notion of a memory image.

Miriam is an astronaut who bids her lover a fond farewell before setting off into space. 'Since she is never to return, NASA have set up an intricate system of image intensifiers and reflectors along the path of her journey, so that at various stages she can catch a glimpse again of her lover's fond farewell, by looking in the right direction towards a mirror' (2001, p. 267). In this way, she will indeed re-experience the episode. But when Miriam simply *remembers* the parting, the situation is nothing like this. Where, in the image-intensifier case, Miriam is apprehending a past episode in the sense of *having the experience over again*, in the natural-recall case she is representing the original encounter. This is not to say, however, that there cannot be a crucial role for imagery in the natural case.

What then is the role of the memory image in the remembering case? We are faced with a dilemma here, according to Martin. Either we (1) hold on to the idea that the episodic image is retained apprehension or experience, and in so doing

admit that we must give up on the idea that one thereby enjoys experience of the past *as* past; or (2) say that there is something distinctive about the phenomenology of the episodic image (as contrasted with that of the original experience), in which case we lose sight of the sense in which the memory image retains something from the earlier experience. Martin suggests how this dilemma can be resisted. The dilemma arises, he says, from the false assumption that if episodic memory is 'retention of earlier apprehension' (which it is), then what is experiential in episodic memory is essentially *identical* to the original perceptual experience: that memory images and perception share a common code. Take the case—a famous one owing to Sartre (1991)—of visualising an absent friend. When we have the visual image of him it does not seem to us that he is present; rather, we *represent a presentation of his presence*. The difference between seeing the friend and visualising him when absent lies not in the nature of the experienced object but in the way in which the mind relates to the object—as presentation or as re-presentation. The *recalling* Miriam represents the past experience in a memory image; she does not have to have the identical experience over again; and there is no common code between the original experience and the episodic memory.

But does not the idea of synthetic WWW binding look fatally similar to the 'common code' between perception and recollection that Martin rejects? No, at least not if this common code means a common visual (or auditory, or tactual) phenomenology. To say that an episodic recollector is having a synthetic, bound WWW representation is not to assume that the recollector is having a (say) visual experience. Indeed, many of us will have come across people who deny that their episodic memories of seen events have any visual phenomenology. There is nothing incoherent in the idea that the re-experience will have spatiotemporal content, but not in any particular modality, such as the visual. It is, then, a 'representation', but it is one of a perceptual experience, and will for that very reason inherit the kind of spatiotemporal information that any experience must have.

6. To Conclude

We contend that there could be a form of episodic memory in young children that is essentially nonconceptual and yet is also necessarily characterised by its phenomenal content. The next task is to demonstrate its existence.

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