10 Memory, Attention, and Joint Reminiscing

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1 Introduction

Since grammar school was far away from home, I often endured long bus rides in heavy traffic. To avoid boredom, my friends and I used to play "Veo Veo"—"I See, I See"—the Colombian equivalent of "I spy." One of us, gazing through the window of the bus, would glance over the busy scenery of the city. Meanwhile, everybody else would keep their eyes closed. Eventually, the kid surveying the scene would single out a particular object and would say "Veo Veo." That was the sign for the rest of us to open our eyes and ask "¿Qué ves?"—"What do you see?" He would then give us a clue, a particular feature of the selected object, and we would then try to guess the object he had in mind. We could ask up to five questions of the form "Does it have an X?" where X was a property of the object we thought the kid was attending to. If the kid said "no," that meant we were focused on the wrong object, so we would have to attend to a different one. If the kid said "yes," then one could either keep asking—to make sure one had the right object in mind—or one could try to guess what the object was. If you were wrong, you were out. But if you guessed correctly, you'd get to pick the next object. The point of the game was to be the first one to attend to the same object as the kid who got to pick it.

What we were doing was an exquisite exercise in what psychologists call *joint attention*: our capacity to attend to the same external target and realize that the other person is attending to the same one (Moore & Dunham, 1995). Consider the moment in which the kid who had mentally selected the object in his visual field realizes that another kid has guessed correctly. How does the former know that his thought refers to the same object the latter has in mind? First, both of them need to have the selected object in their visual fields. This, however, is not enough, as likely other kids, at some point, might had the selected object in their visual fields. Additionally, they both needed to single out that object from its surroundings; both of them must have selectively attended to it. But again, this isn't enough. Another kid, whether playing or not, may have been attending to that very object, at that precise moment, without realizing that the object of his or her attention was the object chosen by the kid who was picking it out. What it is required, then, is a kind of attentive triangulation, whereby both kids are aware of the object and of each other with the recognition that each other knows that the object they are attending to is the chosen one. According to Campbell (2002), this attentive coordination makes the other subject, as well as the object, *constituents* of the content of their joint mental state.

Now suppose that we want to play a different game, one that we may call "I Remember, I Remember." It is just like "I see, I see" except that, in this version, one of the participants remembers a particular object while the others try to guess what she has in mind. It sounds much harder, doesn't it? After all, unlike the case of perceptual joint attention, the alleged constitutive relation between the perceivers and the object of attention cannot be met. In the case of joint reminiscing, the intentional object is not present—it may not even exist. Moreover, unlike perceptual joint attention, it isn't required that both subjects were ever at the same time in direct contact with the object of their memories. For instance, one can jointly reminisce about an old professor with another alumnus of the same school one just met. Of course, it may be possible that, in the course of jointly reminiscing, both realize that they shared a class, but it need not mean that, at the time, they both were aware of each other jointly attending to the professor.

Surprisingly, though, we engage in joint reminiscing all the time. What does it take for us to engage in joint reminiscing? Specifically, how can two or more people jointly refer to an object that is long gone—or, at least, that is not present in their surrounding? In this chapter, I offer a three-part answer to this question. First, I suggest that our capacity to remember intentional objects during memory retrieval depends on our capacity to direct our attention inwardly toward the relevant component of a memorial content—a mental act I call, in the spirit of Prinz (2007), *mental ostension*. Second, I argue that, in order for us to refer to remembered intentional objects, we must possess the ability to refer to them indirectly or "deferredly" by way of mentally ostending toward a present mental content; in short, we must be capable of *deferred mental ostension*. Third, I claim that in order to jointly reminisce, we must have the capacity to guide someone else's attention inwardly toward the relevant aspect of the mental content we want them to focus on so that they become aware of the past object we are deferredly ostending. I call this *concerted deferred mental ostension*. I explain each element of this account in turn.

2 Memory and Mental Ostension

Imagine this event. I am grocery shopping, strolling down the aisles, when all of the sudden I hear a female voice, behind my back, calling my name. Think of what happens as a result of my hearing this brief sequence of phonemes. First, as I was silently focused on a particular visual scene, the noise made my attention shift from the shelves onto the stimulus behind my back. Given the silence around me, any auditory stimulus would have done that, of course. But this noise was a particularly relevant sequence of phonemes: it was my name. Had it been any other sound against a noisy background, I may not have heard it. My brain is attuned to certain noises that are socially relevant for me, like my name, and as result it makes me conscious of them even if I had been sensitized to background noises of equivalent pitch and volume (Wood & Cowan, 1995). This shift of attention to an exogenous stimulus, which my brain had already recognized as socially relevant, in turn shifts the cognitive mode I am in to what Tulving (1983) called "retrieval mode": a mental state in which I am poised to retrieve information from memory. This shift occurs as I turn my back toward the source of the stimulus, no more than 500 milliseconds after its onset. The face, the tone of voice, and the mannerisms of the woman behind me constitute the perceptual cues with which I now try to recognize her—but to no avail. Perhaps noticing my facial expression of confusion, she appends her call with a new utterance: "We met last week at your party." This new string of auditory information, added to already in-process perceptual cues, reactivated further sensory contents toward which I now turn my attention inwardly. Now I am covertly surveying different sensory mental contents. These contents are presented to me as blurry snapshots, maybe even quick footages, of scenes featuring my house and my friends in situations I recognize as having happened last week during my party. All of the sudden, there is a match between the perceptual cues and the sensory contents I'm aware of—a phenomenon Semon (1904/1921) called "ecphory." My attention has been focused upon a particular region of a scene in which I see a person that highly resembles my interlocutor. She's dancing, wearing a funny-looking hat.

(1) I remember *that* hat!

I say now to the woman in front of me, and she smiles approvingly. No more than a few seconds elapsed since she said my name.

To make sense of this example, we need first to understand how we become aware of retrieved memorial contents, which in turn requires us to understand how we manage to retrieve memorial contents. Let us start with retrieval. Most philosophical accounts of memory retrieval have been mere speculations based on the commonsensical idea that experiences are somehow saved in a metaphorical storehouse, where they lose vivacity over time as though they were accumulating dust, awaiting their eventual retrieval during recollection. Recent developments in cognitive psychology and neuroscience have shown that this view is mistaken. For one, memory consolidation—i.e., the physical process by means of which the brain changes so as to encode experienced information in a memory trace—is a highly selective process. Not all the information that was initially perceived is encoded, and not all of the information that is encoded is available for retrieval. Much of our sensory information is lost due to inattention and working memory limits, as well as normal decay caused by lack of rehearsal and selective consolidation during sleep (Paller & Voss, 2004). In addition, the encoded information does not remain stable over time. Almost four decades of research in the cognitive psychology of false and distorted memories have shown that, during retrieval, memories become malleable and prone to being contaminated by extraneous information (Roediger, 1996). Finally, evidence also suggests that events that were only sketchily encoded can nonetheless be remembered with detail via pattern-completion processes that fill in the missing information in surprisingly reliable ways (McClelland et al., 1995).

As a result, there is now wide consensus among neuroscientist regarding the *reconstructive* character of our memories (Schacter et al., 1998; Schacter & Addis, 2007). Remembering does not consist of the exact reproduction of previous experiences, but rather of the reconstruction of previously entertained mental contents by way of reactivating the brain regions that processed them during encoding (Rugg et al., 2008; De Brigard, 2012). Reactivation, of course, is not all there is to remembering, as we need to tell apart memories of previous events from experiences of current events. The brain manages to do that by way of incorporating, during retrieval, brain regions that were not involved during encoding and by redeploying some of the same regions for different purposes. In particular, whereas encoding recruits the sensory cortices and the medial temporal lobes, retrieval additionally recruits pre-frontal and parietal cortices (Buckner & Wheeler, 2001), which likely engage meta-cognitive processes such as source monitoring.

To better understand this process, recall the previous example and consider how my memory of the woman's hat gets first encoded and then retrieved. Suppose that, at my party, I did in fact attend to the woman and her hat. My sensory cortices first processed this fleeting perception in a distributed manner (i.e., visual information in occipital cortex, auditory information in auditory cortex, etc.). Since I did pay attention to her and to her hat, (most) of this perceptual information was processed by my working memory, and some of it was, in turn, bound together—presumably by the hippocampus—as a single, unified event. Neurophysiological evidence suggests that the area CA3 of the hippocampus carries out this binding and stores a sort of index of the episode (McClelland, McNaughton, & O'Reilly, 1995). However, this index does not include any sensory information per se. Instead, it records the manner in which the pattern of sensory activation during my perceptual experience occurred in order to re-enact it at retrieval (De Brigard, 2017). Thus, when presented with a cue—in this case, the utterance of my name—the brain gets into retrieval mode, which apparently is subserved by the fronto-polar cortex (Rugg & Wilding, 2000). Using every piece of sensory data as a potential cue for retrieval (e.g., the woman's voice, her physique, etc.) my brain tries to get the hippocampal index to reactivate a perceptual pattern. Yet it is only upon the pronunciation of the right cue—in the example, a contextual-semantic piece of information—that ecphory is achieved, and the right index gets to reactivate, more or less, the pattern of neural activity in which it was when I first perceived the woman at my party. Incidentally, the fact that every time a memory trace is reactivated it occurs in a different neuronal and experiential context (e.g., the mental state one is in at the time of recollecting) means that each reactivation of a memory is also an instance of reconsolidation (Moscovitch et al., 2005), which helps to explain why retrieval makes memories vulnerable to distortion (Hardt, Einarsson, & Nader, 2010). In sum, the content of my memory is the result of a complex process of sensory reactivation in which subpersonal level representations are bound together to reconstruct the perceived content during retrieval.

Now, how did I become aware of this content? More specifically, how is it that the retrieved content presents to me as being about this woman's hat at my party? My suggestion is that it becomes conscious when I covertly focus my attention on the region of my retrieved representation depicting the woman's hat. Only then was I able to (subpersonally) match the retrieved content with my present perception, and only then was I able to recognize her as the woman I am talking to right now. Additionally, it was only when the attended content of my representation became the focus of my conscious experience that I was able to say that I remember her wearing a hat at my party. In other words, it was by way of mentally delineating a particular region of my intentional content that this aspect of the scene was mentally highlighted to me, and it was this highlighting that made it available to my conscious reporting. This process is basically the memorial equivalent of what Campbell (2002) calls the *Causal Hypothesis* for visual perception: "When, on the basis of vision, you answer the question, 'Is that thing F?' what causes the selection of the relevant information to control your verbal response is your conscious attention to the thing referred to" (p. 13). My claim is that the same mechanisms by means of which you consciously attend to a region of space are responsible for the experiential highlighting in a memory experience. I call this experiential highlighting "mental ostension" (tantamount to what Prinz (2007) calls "mental pointing"). To mentally ostend an aspect of an intentional content is to focus one's attention inwardly toward such aspect. And mental ostension is the mechanism by means of which the mental content—or the region of the mental content—we attend to becomes available to consciousness (De Brigard & Prinz, 2010).

This hypothesis finds strong support in results coming from cognitive psychology and neuroscience. In the early years of cognitive science, it was thought that attention was necessary for encoding but not for retrieval. Specifically, it was argued both on the basis of attentional deficits (Critchley, 1953) and experimental manipulations (Baddeley et al., 1984) that impaired attention negatively impacts recollection only at encoding, not at retrieval. However, Fernandes and Moscovitch (2000) showed that this conclusion is not warranted when the secondary task is material-congruent.

For example, if the retrieval task is verbal, a word-based secondary task would be more detrimental to successful recollection than a digit-based or a picture-based task (Fernandes et al., 2005). More recent studies have further demonstrated that under deep versus shallow encoding conditions (Hicks & Marsh, 2000), as well as strategic versus nonstrategic encoding (Lozito & Mulligan, 2006), divided attention tasks are detrimental during retrieval and can negatively affect not only hit rates but also meta-memory judgments (Skinner, Fernandes, & Grady, 2009). The neuropsychological evidence has also been challenged. Although damage in posterior parietal cortex usually causes attentional deficits (e.g., hemispatial neglect), it is typically thought that retrieval processes remain intact. But a study of two patients with damage in ventral parietal cortex showed severely diminished free-recall of autobiographical memories relative to controls (Berryhill et al., 2007). Indeed, when considered as a recall test, the classic study of Bisiach and Luzzatti (1978) on hemineglect further supports the claim that attention may be required at retrieval. In this study, Bisiach and Luzzatti (1978) asked a patient with severe hemispatial neglect to remember the main square in Milan, the city he lived in all his life. Although his language capacities where impeccable, his report omitted all the buildings to the left of the square when he remembered it facing one direction. Then he was asked to imagine crossing the square and turning back so that now he'd be facing the opposite side. Again, he failed to report the left-hand buildings—even though those were the buildings he had just reported!

A final piece of evidence supporting this hypothesis comes from neuroimaging. The involvement of attentional areas of the parietal cortex during recollection is a frequent finding in PET and fMRI studies of episodic retrieval (Rugg & Henson, 2002). As a result, some theorists suggest that the parietal cortex may be playing a similar role during recollection as it does during perception. According to their "Attention to Memory" (AtoM) hypothesis (Cabeza et al., 2008), for instance, the dorsal parietal cortex, which is usually associated with top-down attention, is involved in voluntary, goal-directed retrieval, whereas the ventral parietal cortex, which is usually involved in bottom-up attention, appears to be associated with involuntary recollection. A related hypothesis suggests that the parietal cortex may play a role analogous to the working-memory buffer, gating stored information for decision-making and action (Wagner et al., 2005). Finally, the Cortical Binding of Relational Activity (CoBRA) suggests that the parietal cortex may selectively modulate the reactivation of disaggregated sensory components during retrieval in order to bind them together—reconstruct them—as a unified recollective experience (Shimamura, 2011). Despite the subtle differences among these views, what matters is that there is general agreement in that retrieval related activity in partietal cortex signals its critical role in the selection (either voluntary or involuntary), modulation (either top-down or bottom-up), and maintenance of internally generated information. And if we accept a functional description of attention as the filtering, selection, and modulation of information (De Brigard & Prinz, 2010), then the filtering, selection, and modulation of internally generated information (Chun, Golomb and Turk-Browne, 2011), of which memorial contents are a sub-class, is tantamount to accepting that internal attention is needed for retrieving memorial contents (De Brigard, 2012).

So far, the evidence reviewed supports the claim that internal attention is needed for retrieving the contents of our memories, but is it needed to render such contents conscious? The question as to what are the precise mechanisms that allow us to become aware of certain mental contents is hotly debated. Nevertheless, attention plays a pivotal role in the most prominent neural theories of consciousness, including the influential Global Neuronal Workspace (GNW) hypothesis (Dehaene & Changeux, 2000; 2011). Roughly, the GNW postulates two computational spaces in the brain: local, informationally encapsulated, and specialized processing networks, and a distributed, nonencapsulated associative GNW. Contents that are processed by local networks can become conscious when they are broadcasted onto the GNW. Critically, attention is suggested as the mechanisms that allows this informational amplification to take place. Do we have any evidence to the effect that internal attention at retrieval modulates the informational amplification needed for broadcasting contents to the GNW? I think we do. Consider neurophysiological evidence. We know that attention acts upon local networks by modulating their synchronized firing (Steinmetz et al., 2000). These neuronal changes are correlated with increases in the gamma frequency, which predicts not only successful encoding (Sederberg et al., 2003; Paller, Voss, & Westerberg, 2009) but also retrieval of old, and correct rejection of new, items (Gruber et al., 2004; Osipova et al., 2006; Jensen, Kaiser, & Lachaux, 2007). Moreover, in a study involving intracranial electroencephalographic recordings, Sederberg and colleagues (2007) discovered that the same pattern of gamma-frequency activity that predicts successful encoding reappears at retrieval. This oscillatory activity emerges in the prefrontal cortex and the hippocampus, and then spreads onto the sensory cortex (Osipova et al., 2006), following the same pattern of activity observed in the prefrontal/medial—temporal/parietal cortex network underlying conscious retrieval.

Neuropsychological results give further support to the claim that internal attention gates memories into consciousness. If, as hypothesized, parietal regions modulate the availability of local sensory representations to the GNW, one should expect a diminished sense of "re-experiencing" in patients whose parietal lesions hinder such broadcasting. This is precisely what Berryhill et al. (2007) report: patients with bilateral parietal lesions report fewer episodic details and lower levels of vividness during free-recall of autobiographical memories, suggesting that a reduced number of sensory contents were actually made available to their conscious experience. Relatedly, Davidson et al. (2008) reported that patients with parietal lesions showed a reduced number of "remember" responses, which are associated with increased subjective experience of recollection, relative to both "know" responses and controls (Drowos, Berryhill, & Olson, 2010). Finally, Simons et al. (2010) found that patients with bilateral parietal damage showed lower confidence levels for source recollection tasks, a result they interpret as suggesting that parietal lobe lesions impair subjective experience of episodic recollection. The view that internal attention is required for conscious recollection is consistent with their interpretation.

Let's take stock. In this section I argued that retrieving episodic information involves reconstructing subpersonal level representations by binding reactivated sensory information in a process that involves interactions among the parietal, the medial-temporal, and the pre-frontal cortices (De Brigard, 2014; 2017). Next, I suggested that the content that becomes available for consciousness is that toward which we direct our internal attention. Finally, I suggested that attended contents become conscious when they are rendered available to the GNW, which in turn poise them for use in working memory, and thus linguistic production. When the resultant verbal production is vocal it constitutes an utterance that—modulo communicative intentions and good faith—aims at reporting the mental state of which it is an effect. If this account of what happens when I utter (1) in a situation like the one exemplified previously is roughly correct, then we have the components that we need to clarify the first part of the three-part answer to the question of joint reminiscing with which I started this chapter: to mentally ostend an aspect of a mental content is to internally attend such a content. We need now to see how we can go from mental ostension to reference and, then, to full-fledge joint reminiscing.

3 Remembering as Deferred Mental Ostension

If the previous account is on the right track, remembering a past object involves, in the first instance, our capacity to mentally ostend toward an experiential content, and it is by way of mentally ostending toward such content that we can make it available for conscious reporting. As it stands, however, this view poses a difficult question. In the case of perception, the object that is mentally ostended—or 'experientially highlighted,' in Campbell's verbiage (2002)—is in direct contact with the perceiver. Indeed, in the relational (realist) view that Campbell puts forth, the object becomes a *constituent* of the experiential content. Thus, for Campbell, there is no need to separate the intentional content and its object when it comes to making them available for consciousness. However, in the case of memory, the object of one's recollection isn't in direct contact with the rememberer. In fact, the object of one's memory not only is not present when we remember it; it usually no longer exists. How can we be aware of an object or event with which we are no longer in direct contact?

One possibility is to go the *direct realist* route (Reid, 1785/1849). According to this view, remembering is tantamount to direct perception in that the intentional objects are directly apprehended. Intentional contents, particularly representational contents, are thus disposed of. For direct realism has it that remembering is just like perceiving, except that its objects—i.e., that which is remembered—do not exist in the present: they exist in the past. Although relatively popular in the past (Laird, 1920), direct realism for memory fell in disrepute. It faces, after all, difficult obstacles. For one, direct realism suggests an analogy between memory and perception, but it does not specify the extent to which they are similar, or how to accommodate their obvious differences. Memories, for instance, are phenomenologically different from perceptions, and they are usually coarser. Memory and perception also differ in the capacity to provide us with discriminatory information. For instance, while we can visually discriminate similar shades of red when perceived simultaneously, we can't when relying solely on memory (Nemes, Parry, & McKeefry, 2010). Also, memories decay and are often blurry and lifeless. Nonsalient events tend to be more easily forgotten than salient ones, even if the salient ones occurred much before in time. It is hard to see what the equivalent of this kind of saliency effect would be for perception. Finally, there is the problem of false memories. Many of our veridical memories are actually the result of the same mechanisms that give us non-veridical memories (Schacter, 1995, De Brigard, 2014). But non-veridical memories are about events that never occurred. Thus, the direct realist would have to explain not only how can memory be in direct contact with an event that no longer exists—or that exists in the past—but also with events that never existed. Some metaphysical maneuvering could potentially solve these issues, but I doubt we want to pay such price when the alternative is to accept the existence of representational contents (Furlong, 1948).

Aware of these problems, Campbell suggests a different non-representational alternative, based upon McCormack and Hoerl's notion of *temporal decentring*: "The ability to temporally decenter is the ability to consider alternative temporal perspectives on events and to understand the relationship of these perspectives to one's current perspective" (McCormack & Hoerl, 1999; Evans, 1982). Accordingly, Campbell suggests that our capacity to refer to remembered objects or events depends upon our capacity for temporally decentering. It is only when we acquire the capacity to temporally decenter that we can grasp the truth-conditions of judgments tensed at times different from when they are uttered. Accordingly, in order to understand the sentence:

(2) I see that you are wearing a hat at my party

when uttered in the presence of the object of attention (i.e., the person wearing a hat at my party), we only need to be able to grasp the truth-conditions of the judgment as it applies to the current situation. But in order to understand (1) we need to be able to move away from the current temporal situation, and grasp the truth-conditions of the judgment *as if* it had been made at a different time, namely the relevant moment in the past. Therefore, there is no need for direct contact with the past object, nor a reference to any intermediary mental representations. All that is required is the acquisition of a particular skill—i.e., temporal decentering—so that we can refer to the object of our conscious recollection as if we have been talking about it at a different time (Campbell, 2002: 181)

Although I am not completely unsympathetic to this view, I find it unsatisfactory for two reasons. First, according to McCormack and Hoerl (1999), the development of episodic memory depends upon our acquisition of temporal decentering, which in turn depends upon the acquisition of the concept of personal/perspectival time. Although this hypothesis seems to fit some data in the developmental literature, it has a hard time accommodating data coming from neuropsychology. After all, individuals with amnesia are perfectly capable of using personal/perspectival concepts, thus they are perfectly capable of temporal decentering, even though their episodic memory is damaged (Craver et al., 2014; De Brigard & Gessell, 2016). This suggests that temporal decentering is independent of episodic memory. Second, defining something as a cognitive skill or capacity does not preclude it from requiring representations, whether conscious or unconscious. Motor skills, for instance, may require representations in the form of programs to be executed or motor sequences (Pavese, 2015).

The good news is that we can keep the intuition that mental ostension is the mechanism by means of which we can refer to the object of our memories without having to accept temporal decentering. I suggest that what allows us to refer to past objects when we are consciously attending to a particular mental content that presents itself as being about a previous experience, is the covert equivalent of our overt capacity to demonstrate deferredly. Notice that the root of the problem we are facing is that what we mentally point at when we remember is not identical to what we refer to. Consider (1) again. When I uttered (1) I am not talking about my mental experience but about the past event involving this woman's hat at my party. It is an event that no longer exists. But what I am inwardly attending to—what I am mentally ostending—is a region of the intentional content I am being aware of, right now, as I am having the mental experience of remembering the woman's hat. Schematically, if '*p*' stands for the intentional object of my memory, and '*r*' stands for the intentional content of my memory, according to my proposed account, when I remember that *p* I am talking about *p* while ostending *r*.

Linguistically, the phenomenon of ostending at a certain thing '*r*' in order to refer to a different thing '*p*' is known as *deferred ostension* (Quine, 1968: 194). Consider the classical example due to Evans (1981: 199). We are walking down the street and I point toward a parked car covered with parking tickets. Pointing at it I say, "That man is going to be sorry." The intuition here is that even though I am pointing at the car—that is, even though my demonstration (Kaplan, 1989) is directed toward the car—the object demonstrated or referred to is not the car, but the *owner* of the car.

Or consider the situation in which I point to a set of footprints and say, "He must be giant!" or the case in which I am holding a copy of *The Confederacy of Dunces* and say, "He's my favorite author" (Borg, 2002). These too are cases in which I am pointing at something (e.g., footprints, a book) while referring to something else (e.g., whatever animal left the footprints, John Kennedy Toole).

My suggestion is that the same sort of phenomenon occurs when we remember episodic memories. To understand what the objects of our memories are, and consequently to be able to talk about the objects of our memories, we first learn how to mentally refer to something that is not perceptually present in one's environment but that nonetheless is present in our conscious experience. Developmental psychologists have debated for decades whether preverbal children have episodic memory.[1] Nonetheless, probably all developmental psychologists agree that deferred imitation of action sequences does in fact demonstrate the emergence of episodic memory (Barr, Rovee-Collier, & Campanella, 2005). Moreover, older adults with medial temporal lobe damage as well as individuals with developmental amnesia have trouble with this task, further suggesting its intimate relation with episodic memory (Adlam et al., 2005). In this paradigm, infants are shown a relatively unusual sequence of actions with a particular object. For instance, the experimenter may show the child that in order to get the key out of the box she needs to first hit the box three times with the tip of the magic wand and then once with the bottom. Then the child is either left alone (and recorded) or the experimenter leaves for a few minutes and comes back with the wand, asking the infant whether she can get the key out of the box. Prior to 6 months of age, infants are completely incapable of reproducing previously learned action sequences. There is some evidence that they can perform deferred imitations of brief sequences after 6 or 7 months of age, as long as the retention interval—i.e., the elapsed time between study and test—is kept short (Barr & Hayne, 1996). Gradually, children learn how to perform action sequences that are increasingly more complex, that have longer retention intervals, and that are retrieved with less specific cues (Hayne, Boniface, & Barr, 2000). By the second year of age, deferred action sequences are pretty much established.

Notice that, prior to 6 months of age, infants are capable of pointing. If one shows a 4-month-old the magic wand, she can point at it. Nonetheless, she does not see it as related to anything that happened before. It is just another object in the visual field, however interesting it may be. After 6 or 7 months of age, though, the infant appears to be able to see the magic wand as something more than a mere present object. She sees the magic wand as related to a previous event. The mental content elicited by the perception of the wand is now experienced as being about something other than the want. The wand becomes a cue. Now, the experimenter is able to ostend at the wand, while the infant perceives it, and ask for the right sequence of actions: "Can you get the key out of the box?" The fact that the infant can indeed come up with the right sequence of actions strongly suggest that she knows that one can talk about a previous ‘p’—a sequence of actions—while pointing at a present ‘r’—the magic wand.

As time goes by, the perceptual cues can become less and less concrete, that is, less and less similar to the perception of the original event. Eventually, a pretend wand can elicit the memory, then just the waging of a finger, the uttering of a word. Suddenly, the demonstration of the cue, and perhaps the cue itself, becomes irrelevant. All that matters is that the cue can elicit the retrieval of the right sort of mental content and that it can experientially highlight the relevant property of the resultant conscious experience. Neither my hearing the woman’s voice nor my seeing her face succeeded in triggering the right memorial content. It was only when she gave me the contextual information that ecphory occurred, and the right intentional content was then retrieved.[2] Now, the sensory information I have been presented with mentally highlights certain aspect of that content, which is experienced by me as a reinstatement of the perceptual event of seeing this woman dancing and wearing a hat. Mental ostension is, thus, an acquired skill, and deferred mental ostension is a way we learn to use mental pointing to refer to something else—usually that which caused the retrieved intentional content to begin with.[3] My suggestion, therefore, boils down to no more than this: we can talk about the intentional objects of our memories because we can refer deferredly to them by mentally ostending toward the intentional contents we experience when retrieved by the right cue. Remembering a past object is a case of deferred mental ostension.[4]

4 Joint Reminiscing as Concerted Deferred Mental Ostension

In the second section, I argued that memorial contents are reconstructed out of subpersonal level representations via a process of pattern-completion that reactivates, more or less,[5] the sensory cortices that were engaged during the perception of the remembered event. Then I argued that we become conscious of these mental contents when we direct our attention inwardly to them. I called that process *mental ostension*. I suggested that the memorial contents we mentally ostend at are thereby reportable, as they have been poised for verbal control in working memory. Then, in the third section, I claimed that mental pointing was not enough to explain how we get to talk about objects that aren’t in the surroundings of the rememberer. I argued that the capacity to talk about something not present while ostending something present was required for the rememberer to be able to talk about remembered objects. Following the convention in linguistics, I called that capacity *deferred mental ostension*. Now, in this last section, I suggest that to acquire the capacity to jointly reminisce we need to learn how to orient our attention inwardly alongside other coreminiscers in order to mentally ostend memorial representations with the same contents, which in turn allows us to speak about the objects that those contents represent.

Consider, once again, the situation in which I utter (1). Imagine that, after my brief encounter at the supermarket, I ran into a friend whom I know was at my party, and the following dialogue takes place: “I just ran into the woman who spilled wine in my carpet at the party.” “Which one?” my friend asks. “I don’t remember her name,” I reply. “You mean the woman who was wearing a hat?” “That one!” I say. What just happened? Think of what occurred during this brief exchange. I ran into my friend and by mentioning my recent encounter at the supermarket, I shift his cognitive mood toward that of reminiscing. When he asks, “Which one?” I assume he’s trying to single out a particular individual from his own memory experience of the party. In other words: my opening sentence serves as a verbal trigger for *his own* memory trace of the party. Now he’s surveying, via his own top-down attentional mechanisms, his own intentional content. But, of course, he does not know whom am I talking about yet. There were many women at my party. He thus asks for a distinctive feature that may help him single her out: her name. Since I don’t know her name he tries a new one: the hat. He is now mentally pointing toward the region of his intentional content depicting the woman in a hat, so he asks for confirmation. My saying “That one!” confirms that we are talking about the same remembered object and signals the moment we realize we are jointly reminiscing.

Let me stress this point. Most discussions of perceptual joint attention appear to make the act of pointing—what Kaplan called “demonstration” (Kaplan, 1989)—essential for the process to effectively take place. But one can engage in joint attention without any demonstration overtly taking place by any of the attendees. An object can demonstrate itself, as it were, by making itself salient in one’s experiential field. Suppose you are watching a soccer game when, all of a sudden, an enthusiastic fan runs from one side of the court to the other wearing no clothes. The event did not disturb the development of the game, but it was enough to grab the attention of many people in the audience, including yours and your friend’s. “Do you see *that*?” your friend asks. There is no need for him to overtly point toward the enthusiastic fan. Your attention, just like your friend’s, has been disengaged from what it was focused on before—the player with the ball, presumably—and it has moved onto a new target: the zealous fan. The demonstrated object is its own demonstration. Likewise, one can guide someone else’s attention toward a particular target without having to use overt pointing. One can help the other person navigate the perceptual field using intermediate salient targets as reference points. Suppose you fail to notice the naked fanatic because it failed to disengage your attention from the soccer ball. Thus, when your friend asks you whether you’ve seen *that*, you rightly ask, “what?” Given the distance between the naked fan and your seats, pointing is useless. And given the fact that he’s holding a hot dog with one hand, and a beer with the other, hand-waving is out of the question. So, he finds a landmark, a salient reference point, and orients your attention from there. “See the side referee? Draw an imaginary line from him to the goal, and you'll see what I'm talking about." Your attention has been reoriented, and now you are both jointly attending at the same target.

I believe that an equivalent process goes on in the case of joint reminiscing. I can expect my friend, whom I know was at the party, to have encoded much of the same information I encoded then. The information we both encoded isn't identical, of course. Even if we were looking at the woman from the same side of the room at the exact same time, we both occupy different spatial locations, so our perspectives are going to differ. But these differences need not matter. Memorial contents represent their objects with varying degrees of correctness, and just as there may be differences *within* a subject between the way an event was originally perceived and the way it presents itself during recollection, there may be also subtle differences *between* subjects that still allow us to talk about the same memorial content being entertained by two or more joint reminiscers. Just as in the case of the fan in the soccer game, I can guide my friend's attention to highlight a particular aspect of his intentional content—the woman with a hat—so it becomes the target of his mental ostension. I can use—as in my imaginary example—a reference to a salient feature of the object itself: the hat. But I could have also oriented my friend's inward attention using other reference points: e.g., she was dancing by the window. The process can also go the other way around. Upon remembering this woman, my friend may be able to reorient my attention toward a different aspect I did not remember at the time—her perfume, say, or the fact that she had brought a delicious bottle of wine. The capacity to mutually coordinate each other's attention so as to consciously highlight (approximately) the same mental contents I call "concerting." Consequently, our capacity to talk about the very objects represented by the intentional contents we are conscious of during joint reminiscing would be *concerted mental deferred ostension*.

Memory allows a temporal dimension of concerted mental deferred ostension that isn't present in perception: we can direct each other's attention along a temporal line. In other words, we can mutually direct each other attention toward memorial contents depicting events that occurred before or after a certain target event. For instance, when jointly reminiscing about the woman at the party, my friend can reorient my attention toward the beginning of the party, and mentally highlight to me the fact that she brought a bottle of wine. In fact, he could even guide my attention backwards in time, reminding me that the party was not the first time I met that woman. "Remember, about a month ago, we had that picnic at the park?" This kind of concerted mental ostension along temporal dimensions is unique to memorial contents, and empirical evidence strongly suggests that concerted mental ostension plays a fundamental role in children's learning how to talk about their memories.

Consider, first, some linguistic data. As Clark (1978) observed, demonstrative terms are usually among the first ten words uttered by English-speaking children, and always among the first 50. Moreover, there is a positive linear correlation between the transition from dyadic to tryadic attention and the use of demonstratives (Iverson and Goldin-Meadow, 2005), which has led some theorists to suggest that a critical linguistic function of demonstratives is to help to coordinate the focus of attention among interlocutors (Diessel, 2006). Consistently, results from developmental psychology suggest that events and/or objects that were jointly attended by children and caregivers during encoding had higher retrieval rates than those that were individually attended or not attended at all (Haden et al., 2001). Moreover, the effect was additive if the event/object was both jointly attended and jointly talked about. Experiments employing collaborative retrieval, which occurs when the caregiver guides the retrieval of the child with the use of wh-questions, shows improvements in several memory measures, including number of episodic details, narrative coherence, and subsequent recall, among others. To illustrate, consider an excerpt from an example with a 2-year-old (Fivush et al., 1994):

Mother: Remember when Mommy and Daddy and Sam went in the car for a long time and went to Grandma's house?
Child: (Shakes head yes)
Mother: And what did we see when we were in the car? Remember Daddy showing you outside the car? What was it?
Child: I don't know.
Mother: Do you remember we saw some mountains and we went to that old house and what did we do? We took off our shoes and walked on the rocks. What else did we do? Who was there?

This is an example of collaborative retrieval with plenty of scaffolding, that is, plenty of retrieval support offered by the mother to the child during retrieval. Now compare this example with another one, reported by Hoerl and McCormack (2004), that involves much less scaffolding during a joint reminiscing session with a 3-year-old:

Mother: What happened to your finger.
Child: I pinched it.
Mother: You pinched it. Oh boy, I bet that made you feel really sad.
Child: Yeah . . . it hurt.
Mother: Yeah, it did hurt. A pinched finger is no fun . . . But who came and made you feel better?
Child: Daddy!

These narratives, Hoerl and McCormack observe, exploit causal links between experienced events in order to guide the children backward or forward in time. And this, I believe, is a clear example of concerted mental deferred ostension. The mother starts off highlighting a particular mental content for the child and invites her to explore certain aspects of that content like the emotion she felt when it happened. Then there is a temporal exploration via focusing her attention in a particular causal link: the transition from being in pain to getting better. Contents that are jointly recovered become reference points from when one can call attention to other aspects of the retrieved intentional content, as in the case of the striker in the soccer game mentioned previously. Mother and child are, thus, jointly reminiscing an event that occurred later in time via consciously attending to a different memorial content representing the effect of the event depicted by the previously attended memorial content. Therefore, when jointly reminiscing, attended contents can become not only spatial but also temporal reference points.

5 Conclusion

To conclude, let me recap the main points of this chapter. First, I suggested that remembering an object involves inward attention toward an aspect of a retrieved memorial content. Following the terminology introduced by Campell (2002), I suggested that in doing so a particular mental content is highlighted or *ostended*. In turn, I argued that the attentional mechanisms behind mental ostension make the intentional content available for verbal reporting.[6] In addition, I argued that for the speaker to successfully refer to the object of her memory, the capacity to mentally point to a present conscious content while referring to a nonpresent intentional object is required. In analogy with the linguistic phenomenon, I called this capacity *deferred mental ostension*. Finally, I claimed that for two or more people to engage in joint reminiscing, and thus to be able to successfully refer to the same past object, they are required to mutually coordinate their attention toward relevantly similar regions of their memorial contents. I called this processed *concerted mental ostension*. Only when there is concerted mental ostension it is possible for two or more remembers to refer to the same past object. Joint reminiscing is, therefore, *concerted deferred mental ostension*.[7]

Notes

1 Some developmental psychologists suggest that visual pair comparison tasks, whereby babies are presented with novel versus familiar objects and their kicking rates are measured, are good indications of the origins of episodic memory. However, many others disagree, as it is always possible to interpret this paradigm as tapping at implicit rather than explicit memory.

2 Presumably, a working hippocampus is required for ecphory to take place. Absent the right sort of hippocampal index, the process of pattern completion required for sensory reactivation is hindered, so no mental content upon which to turn one's inward attention is retrieved. This would explain why individuals with medial temporal lobe damage fail at the deferred action sequences paradigm and, incidentally, partly explains why they fail to retrieve unconsolidated memories.

3 So far, I have only talked about mental deferred ostension, in analogy with linguistic deferred ostension. I wonder, however, if what I have said here may have

also some application to the linguistic phenomenon as well. In a comprehensive study on deferred ostension, Emma Borg (2002) shows that the strategy of treating deferred uses of demonstratives as a different semantic kind of indexicals, is wrong-headed. She presents persuasive arguments to the effect that the differences ought to be accommodated at the pragmatic level. Indeed, she suggest that the same pragmatic rule that works for perceptual uses of demonstratives also works for deferred uses, as long as the child learns that there is more than one way to demonstrate an object. Her proposal, then, "is simply that there are lots of ways to draw an object to attention to facilitate the use of a referring expression, and pointing directly to the object is just one way amongst others—other ways which include pointing at a related object" (Borg, 2002, p. 509). The development of episodic memory may provide the psychological basis for one of these forms, and it is likely that other forms are similarly developed (see, for instance, Hoerl & McCormack, 2004, where learning to refer to distal causes via pointing at current perceptual events is explored).

4 My claim here is one of necessity but not sufficiency. Deferred mental ostension is necessary for memorial reference but likely not sufficient. It is possible that, in addition, we may need to believe that the retrieved mentally ostended content represents an object that is no longer present. (Thanks to Jordi Fernandez for this suggestion.)

5 I say "more or less" because neurological evidence suggests that even though there is reactivation at the systems level, there are changes that occur at the local neural level. The precise relationship between the sensory reactivation at the systems level and the neural changes at the local level is unknown.

6 In my view, uttering a sentence such as (1) to express one's intentional content at the time of recollection is tantamount to describing one's content of experience. As such, the utterance used to express the intentional content of a memory experience has to be understood as a *description* of that content, and it need not reflect the structure of the content at all (Crane, 2009).

7 Previous versions of this paper were presented at the Department of Philosophy at the University of Utah, the *V Colombian Congress of Philosophy* in Medellín, and the Department of Philosophy at the Universidad Autónoma Metropolitana, in Mexico City. Many thanks to all of those audiences. Thanks also to Paul Henne, Jordi Fernandez, and an anonymous reviewer for their comments.

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