

Imagination and the Self

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Abstract

This chapter considers the relations between the imagination and the self. It explores the nature of the self, paying particular attention to two core properties of personal identity—individuality and continuity. Individuality is the property of the self whereby one is recognized to be the same kind of thing as other people and yet different and unique. Continuity is the awareness of the temporal extension of the self or the existence of the self across the past, present, and future. The chapter reviews how these two properties of the self develop and the role played in development by the imagination. The individual self is acquired at the end of infancy and is most clearly manifest in phenomena such as self-recognition. In contrast, the continuous self develops over the preschool period and is manifest in a variety of phenomena, including episodic and autobiographical thinking, as well as future-oriented decision making.

Key Words: episodic thinking, future thinking, personal identity, self, self-recognition, temporally extended self

Why include a chapter on the self in a handbook on the imagination? At first blush, the self might be considered to be the one entity that requires no imagination. For Descartes (1637/1985) the existence of the self could be directly known with foundational certainty: *Cogito ergo sum*—I think, therefore I am. It certainly seems, like Descartes suggests, that we are all directly confronted with our own selfhood on a constant basis. So in what sense might the self depend on the imagination, implying as that term does some creative or constructive cognitive processes? To approach this question, we need to say a few words at the outset first about what we mean by the imagination and then about what kind of entity the self is.

In line with many of the chapters in this handbook, we take the imagination to be at heart the capacity of the human mind to bring to consciousness or to represent some mental object that is

different from that which is currently being perceived. Essentially, the imagination allows objects to be held in mind and thereby considered in the absence of their immediate presentation via perception. This capacity to hold in mind allows the consideration of relations among the objects of imagination and those of direct experience. Of course, the imagination allows the creation of novel objects and thereby novel action—from simple beginnings in such behavior as object substitution in two-year-olds' pretend play (McCune, 1995), the imagination blossoms in creative complexity to allow the construction of elaborate fantasies and stories. As the chapters in this handbook amply demonstrate, the imagination is fundamental to human cognitive development (see also, Harris, 2000).

The idea of the self is tied up with that of personal identity—a notion that has an intellectual history extending back to ancient times. This is not the

place to consider that history in depth and the reader is referred to the historical treatment of Martin and Barresi (2006). However, we can identify in this literature two important aspects to personal identity that we call *individuality* and *continuity*. Regarding individuality, it is clear that each of us has a sense of our selves as a unique person, with various characteristics. Importantly, this self is the same kind of thing as other people—most obviously it has human form and can engage in a variety of intentional activities, including perceiving, feeling, and willed action (Barresi & Moore, 1996). Categorizing the self as the same kind of thing as others implies that others are selves as well. The self is also bound to others in varying degrees through social relations, networks, and cultures. Yet, although we may be of the same kind as others, each of us is also unique. The self defines our individuality and separates us from all others. Our uniqueness is evident in the way we appear physically to others (and to ourselves in reflection). It is also manifest in the uniqueness of the first-person perspective that we all enjoy. Our innermost thoughts and feelings are ours alone.

Persons, and therefore selves, also persist through time. All of us have a past and a future and we identify with our personal pasts and future. For example, we may still feel guilt about a childhood transgression and we eagerly anticipate a planned trip. This continuity of the self occurs despite major changes in our bodily appearance, and even in our attitudes and opinions. For many, the self is believed even to transcend the bodily vehicle in which it travels through life. It existed in some nascent form before birth and will continue to exist after the death of the body. Indeed, it is possible to trace historically, the evolution of the idea of the self from that of the soul (see Martin & Barresi, 2006). The persistence of personal identity depends upon a form of consciousness that allows past and future events involving the self to be made commensurate with our experience of the present. This idea was made explicit by John Locke (see Barresi 2001, p. 141), who argued that consciousness allows reflection on the self as the same thing across time and place. In recent times, Tulving et al. (e.g., Tulving, 2002; Wheeler, Stuss, & Tulving, 1997) have stressed the importance of autothetic (or self-knowing) consciousness in so-called “mental time travel” (cf., Suddendorf & Corballis, 2007) or the ability to recollect personally experienced prior events and pre-experience future events.

Together these two general attributes of the self—individuality and continuity—make up our

sense of personal identity. Each of us is a unique self who persists in time, at least through our life span and perhaps beyond. Our knowledge of this personal identity seems direct and unitary, but closer inspection reveals that it cannot be. To see why, it is necessary to consider what kinds of information are available to us about the self. Neisser (1988) famously distinguished five kinds of self-knowledge, based on information of such different kinds that each “essentially establishes a different ‘self’” (p. 35). For Neisser, two of these kinds of self are based on direct perceptual information—the ecological self and the interpersonal self. These forms of self-knowledge specify the kinds of information pertaining to the self that are directly available through the self’s activities in relation to the environment—both physical and social. But notice that whereas such information may tell us much about our own possible activities from a first-person point of view, the same information is not available about others in an equivalent way. For example, we cannot know others as ecological selves. Therefore, neither the ecological nor interpersonal selves are truly selves in the sense of being known as selves—that is, as an individual self like other persons but also different. We consider how even the basic sense of self as a unique individual depends developmentally upon the imagination.

Other forms of self-knowledge distinguished by Neisser (1988) clearly require imagination and inference. Of particular relevance for the continuity aspect the self, Neisser characterized the “extended self” as the self based on “memories and anticipations: I am the person who had certain specific experiences, who regularly engages in certain specific and familiar routines” (1988, p. 36). The information upon which the extended self is based in awareness of noncurrent events involving the self. These noncurrent events may be remembered episodes from the past or indeed imagined scenarios in the future. It is broadly the capacity to bring to mind noncurrent events involving the self that enables the extended self.

In this chapter, we consider how the development of these two aspects of self or personhood—individuality and continuity—are tied to and depend upon the capacity for imagination. In the second half of the chapter, we consider the development of continuity such that the self is understood to have temporal extension. But first we identify the roots of individuality in the emergent objective self-awareness that occurs in the second year of life.

The Individuality of the Self

There is widespread agreement that knowledge of the self as a separate individual emerges during the second year of life (e.g., Brownell, Zerwas, & Ramani, 2007; Courage & Howe, 2002; Lewis & Brooks-Gunn, 1979; Moore, 2007; Piaget, 1962). To recognize that the self is an individual—like others but also unique—we must know the self in a way that is comparable to the way we know others. This means recognizing that the self has an objective, third-person existence like other people (Barresi & Moore, 1996; Moore, 2007). It is this aspect of the self that depends on the development of the imagination during the second year of life.

Before the development of the imagination, there is of course information available that specifies the self. As noted, Neisser (1988) distinguished ecological and interpersonal kinds of self-knowledge, derived from the patterns of experience infants encounter in their interactions with the physical and social world. From studies of visual preference, we know that infants as young as three months will attend differently to live video images of their own movement compared to similar video images of another infant's movements (e.g., Bahrick & Watson, 1985). Thus, very young infants can already distinguish self from others in the sense of discriminating information derived from self and others. In this context, the perfect contingency between visual and proprioceptive information pertaining to the self's movements allows in principle the discrimination of self from not-self. Therefore, even very young infants are sensitive to the first-person information characterizing self. Clearly, discriminating information derived from the self from that derived from others is not the same thing as recognizing information derived from the self *as* the self. There is not yet a sense of self as the same kind of thing as others.

A simple way of asking the question whether children recognize the self *as* the self is to show children pictures of themselves and other children and ask them, "Who is that?" Using this approach, toddlers will sometimes differentiate the pictures, using their own name for the self-picture only (e.g., Lewis & Brooks-Gunn, 1979). Acquisition of personal pronouns typically comes later, but by the end of the second year, toddlers will often refer to themselves as "me" (Lewis & Ramsay, 2004). Interpretation of this picture-naming approach is problematic, however. First, it is a verbal method and as such not useful for children much younger than about 18 months. Second, it is possible that children are able to use their name to label the picture of self in the

same way that they can refer to any person or object they recognize—simply through having learned the verbal label for that entity. So the earliest reference using their own proper name may not indicate awareness of self. It is important to note that such a concern would not apply to the use of the personal pronoun, which changes its referent depending on who says it.

In recent years, the most popular approach to demonstrating awareness of self is mirror self-recognition. This approach was first developed for children by Amsterdam (1972), who used makeup to mark the cheeks of children from three to 24 months and then recorded their behavior in front of a mirror. Before about 18 months, children showed a combination of social behavior to the mirror image, searching for the image in or behind the mirror, and observing the effects of their own movement in the mirror. After 18 months children started to show self-directed behavior, including touching their faces, thereby evidencing recognition that the image in the mirror corresponded to their own body. This result has now been replicated many times (e.g., Bertenthal & Fischer, 1978; Johnson, 1982; Lewis & Brooks-Gunn, 1979; Nielsen, Dissanayake, & Kashima, 2003) and there is clear agreement on developmental changes in behavior in front of a mirror. However the exact interpretation of the behavioral phenomena is still undecided. At one extreme it has been argued that mirror self-recognition tells us very little about self-awareness but rather reveals a developing understanding of the reflective properties of mirrors (e.g., Loveland, 1986). In contrast, most authors agree that mirror self-recognition does provide information relevant to the development of the objective self, although exactly what is involved is debated (see Mitchell, 1993).

One interpretation is that mirror self-recognition evidences the child's visual self-representation. An important component of this self-concept is facial appearance. Interestingly, even young infants can recognize their facial appearance. Three-month-old infants who are shown prerecorded videos of both themselves and another same-aged infant in a preference paradigm spend more time looking at the other infant than they do at themselves (Bahrick, Moss, & Fadil, 1996). It is likely that regular exposure to mirrors in the first few months of life allows infants to acquire enough experience with their own faces that this stimulus is already familiar within a few months of birth. As a result, infants prefer to look at the relative novelty provided by the face of another child.

However, recognizing the facial image of the self as familiar is not the same thing as recognizing that image *as* the self. Mirror self-recognition is different in that the facial appearance observed in the mirror is understood by the toddler to be the same as the facial appearance that is part of the toddler's mental representation of herself. When she sees the mark on the face in the mirror, she recognizes the discrepancy between the observed image and the mental representation of self and thus explores her own face. Although, the visual self-representation is not limited to facial appearance (see Nielsen, Suddendorf, & Slaughter, 2006), the unique facial appearance obviously is a core part of the self's individuality. Therefore to show mirror self-recognition, children must be able to recognize that the visual appearance of the image in the mirror differs from a stored image of their usual appearance.

However, a unique visual representation cannot be all there is to the self's individuality. The mirror representation must also in some way be referred back to the first-person nature of the self. Thus, a second interpretation of mirror self-recognition is that self-directed behavior in the task depends upon the existence of an integrated body image that draws on proprioception as well as a visual representation of the self. It is this visuo-proprioceptive image that can be compared with the image seen in the mirror (Povinelli, 1995) through the correspondence in the movements perceived both visually and proprioceptively. This correspondence detection is not simply a perceptual detection of the dynamic contingency between the visual and proprioceptive information. As noted, infants are able to detect such contingency as early as three to five months of age (Bahrick & Watson, 1985). Rather, it is a comparison of the mirror image with the body image that incorporates (in the original meaning of that term) both first-person (e.g., proprioceptive and kinaesthetic) and third-person (e.g., visual) information. The toddler cannot only detect the contingency, but also recognize that this contingency between vision and proprioception afforded by mirror observation specifies the self (Mitchell, 1993; Povinelli, 1995). The specification of self in terms of perfect contingency allows the toddler to determine that what is true of the image in the mirror is also true of the self and therefore that the mark exists on his or her own face (Povinelli, 1995).

These two interpretations of mirror self-recognition differ subtly in terms of emphasizing visual appearance alone versus an integrated visuo-proprioceptive image. Nevertheless, both

interpretations specify a role for the imagination. In both cases, mirror self-recognition involves a comparison between perceptually available information—the image in the mirror and perhaps also the visuo-proprioceptive intermodal correspondence—and information that is provided by the imagined image of the self's appearance. The fact that mirror self-recognition develops about halfway through the second year is consistent with the view that it holds a developmental connection to the onset of the imagination in the form of secondary representation. Over the years, a number of authors have suggested that the various phenomena of social cognitive development during the second year depend on general changes in representational ability (e.g., Leslie, 1987; Perner, 1991; Piaget, 1962; Suddendorf & Whiten, 2001). How might general changes in representational ability enable the social cognitive changes seen during the second year? During the second year children become capable of holding in imagination one representation of an object or event while simultaneously engaged perceptually with the world (Leslie, 1987; Olson, 1993; Perner, 1991; Suddendorf & Whiten, 2001). With this change, children are able not only to respond to perceptually available information, but also to consider that information in relation to some other information held in imagination. As a result, the information from the perceptual and imaginative (or representational) sources can be combined into more complex representations. The most obvious manifestations of this developmental change in representational ability are the symbolic skills of pretense and language (Leslie, 1987; Olson, 1993), with pretend play being perhaps the clearest expression of the imagination (Harris, 2000).

A number of studies have now examined the developmental relation between pretend play and mirror self-recognition (e.g., Baudonniere et al., 2002; Chapman, 1987; Lewis & Ramsay, 2004; Nielsen & Dissanayake, 2004). For example, Nielsen and Dissanayake (2004) followed a sample of 96 toddlers through the second year, testing them on a variety of tasks, including mirror self-recognition and pretend play. As a measure of pretend play, the children were asked to drink from an empty cup and to give a drink to a doll from the same empty cup. These tasks directly ask the children to act as if the cup were really full of liquid and so captures the hallmark of pretend play. Although they did not find significant correlations between pretense and self-recognition, both developed in parallel during the period from 18 to 24 months in concert

with other presumed manifestations of secondary representation. The lack of significant correlations between the measures of self-recognition and pretend play is perhaps not surprising in light of the quite different task demands each impose. In fact, there were only modest correlations even within the pretend play **taskslure** occurred despite the facts an important role across age. Nevertheless, the closely parallel patterns of developmental emergence of self-recognition and pretense suggest that both are manifestations of more general developmental changes in imagination.

The phenomenon of mirror self-recognition is perhaps the clearest demonstration that children have acquired a sense of their individuality, but attaining a sense of individuality does not entail a sense of continuity. That this is so is best shown by a modification of the self-recognition procedure first introduced by Povinelli et al. (Povinelli, Landau, & Perilloux, 1996). In their procedure, the child was told that she was going to be videotaped while engaged in some play activities and she first posed for the camera with a particular stuffed toy. She then participated in the play activities in view of the videocamera. During this period of play, the experimenter surreptitiously marked the child's head with a very visible sticker. After the play period had ended, the tape was rewound and the child sat down to watch what had just happened. As the child watched, the marking event appeared and the child could be seen in the video with the sticker on her head. The child's spontaneous reaction was noted and the child was asked who it was that she saw and what was on her head. Instances of the child reaching for the sticker on her own head were noted. Under this condition, younger three-year-olds typically failed to reach for the sticker, whereas by four years, most children did. The three-year-olds' failure occurred despite the fact that they could name themselves in the video and that when subsequently presented with a mirror, they all reached for the sticker on their heads.

Subsequent research has shown that although part of the difficulty children have in this task comes from the use of the video medium (e.g., Skouteris, Boscaglia, & Searl, 2009; Suddendorf, 1999; Zelazo, Sommerville, & Nichols, 1999), this cannot be the whole story. For example, Suddendorf, Simcock, and Nielsen (2007) showed that whereas children showed self-recognition when confronted with live video later than with a mirror, they typically performed well between two and three years of age and certainly earlier than with delayed video.

Unlike the mirror self-recognition task, the delayed self-recognition task requires not only that the image is recognized as the individual self, but also that the self observed in the video is recognized as continuous with the present self. Only then will the child appreciate that those events that occurred in the past are in fact relevant to the current state of the self. It is, therefore, perhaps the clearest demonstration of a developmental dissociation between the individuality and continuity aspects of the self.

Continuity of the Self in Time

Whereas the individuality of the self may at first appear to be more directly known, the dependence of the self's continuity in time has long been recognized to depend upon the imagination. As noted, Locke (1694/1979) believed that it was consciousness that allowed persons to reflect on their identity across different times and places.

And as far as this consciousness can be extended backwards to any past action or thought, so far reaches the identity of that person; it is the same self now it was then; and it is by the same self with this present one that now reflects on it, that that action was done. (Locke, 1694/1979, p. 335; quoted in Barresi, 2001, p. 141)

But conscious memory cannot be enough on its own; there must be some way for the remembered actions to be recognized as relevant to the immediate self. Hazlitt (1805) took up this issue, arguing that persons are not *necessarily* interested (or concerned) about themselves in the past or future. Rather, he observed: “[Imagination] must carry me out of myself into the feelings of others by one and the same process by which I am thrown forward as it were into my future being, and interested in it” (p. 3; quoted by Martin & Barresi, 1995, p. 466). According to this account, the effect of the imagination is in part to create empathy with the noncurrent states of self, and this empathy for the noncurrent self is no different in kind (although perhaps in intensity) from the empathy that may be felt for others. As we shall see, these ideas have clear echoes in modern psychology.

In modern psychology, the idea that consciousness or the imagination enables the continuity of the self is most explicit in research on episodic and autobiographical memory. The concept of episodic memory has its origins in Tulving's work on memory in the early 1970s (e.g., Tulving, 1972) and was used to differentiate memory for particular items of information experienced and then recalled by the

subject from more general semantic knowledge. Over the years the concept of episodic memory has been refined to denote memory for events that were personally experienced and accompanied by a particular form of self-reflective consciousness (Tulving, 1985, 2002; Wheeler, Stuss, & Tulving, 1997). A key aspect of episodic memory as reformulated is auto-noetic consciousness, which is a form of consciousness that is “self-knowing” (Tulving, 2002; Wheeler, Stuss, & Tulving, 1997). Auto-noetic consciousness allows past events to be re-experienced such that the phenomenology of the events is recaptured. Episodic memory therefore is particulate in the sense that it involves representations of particular past episodes involving the self that are imbued with appropriate first-person experience.

In recent formulations (e.g., Atance & O’Neill, 2001; Tulving, 2002; Wheeler, Stuss, & Tulving, 1997), the capacity for auto-noetic consciousness has been expanded to encompass the future as well as the past. Now dubbed *episodic thinking*, it is the capacity to represent any noncurrent events that were, or may in the future be, personally experienced. Episodic future thinking (see chapter 20) involves the generation of imagined future scenarios in which the self may be involved and a pre-presentation or pre-experiencing of the first-person perspective that would be engendered.

For our purposes, we consider episodic memory to be the form of memory whereby past events experienced by the self are in some way re-experienced through recollection. Re-experience means that the phenomenology, or first-person perspective, of the original experience is at least in part reproduced through remembering—there may be affective and quasi-perceptual concomitants of remembering. The reproduction of first person experience associated with the original event establishes the memory as an event that the self experienced; but because the self is represented also from a third-person perspective, the self becomes part of the memory—this was an event involving the individual self. A similar form of integrated experience may also occur for episodic future thinking. When a future event is imagined with the self in it, it engenders the appropriate first-person perspective and this is bound to the self as the potential experiencer of the event.

In contrast with episodic memory, autobiographical memory refers, as the name implies, to the events that together make up the narrative of one’s past life. The notion of autobiographical memory, like that of episodic memory, can also be extended to encompass the future in that it is possible to

consider how past and present circumstances may have implications for the possible future that the self may experience. However, autobiographical thinking involves the representation not just of events involving the self, but also of the relations among those events and the current circumstances of the self. The particular events provided through episodic thinking form the core elements of the autobiographical thinking. Whereas episodic thinking is relatively particulate, autobiographical thinking is inherently relational. The remembered or imagined events provided by episodic thinking are woven into a more intricate narrative with the extended self at its center.

This consideration of the continuity aspect of the self in relation to episodic and autobiographical thinking points to two fundamental developments in the self. First, the child must be able to bring to mind particular past and future episodes involving the self in such a way that both objective and subjective information relevant to the self’s involvement can be represented. This we call the episodic self. Second, these particular events involving the self must be connected together such that contingent and necessary relations are understood. This we call the temporally extended self. In the remainder of this chapter, we consider the evidence on the development of these two characteristics of the self in time, starting with the earlier development—representing the episodic self.

Bringing to Mind Noncurrent Events Involving the Self

Given that all forms of learning involve present action being affected by past events, we can say that in some sense memory is functioning from the beginning of life. However, in many cases of learning, attention is not oriented to the past, it is oriented to the present or immediate future. So, there is no bringing to mind of particular events involving the self. Infants clearly learn from experience, but there is no evidence that they remember past events independently of their effects on current action. Action is simply affected in part by past experience. Similarly, by the end of infancy, experience with regularly occurring structured events has allowed the child to build up representations of familiar events or general event memories (Nelson, 1986; Nelson & Fivush, 2004). For example, children may have general event memories for bedtime routine, going to day care, or going to the park. These general event memories are based on the detection of the recurring patterns of activity experienced during these

events and, as such, they resemble scripts that guide young children's participation in common activities. Although general event memories are relatively abstract representations of past experience, they do not involve the recollection of particular personally experienced episodes.

For past events to be remembered, they have at least to be represented as distinct from present experience and this requires the onset of mental representation. The acquisition of a representational system—in particular, language—is critical for the explicit remembering of previous events. In line with the definition of episodic thinking offered earlier, two features of remembered or anticipated events must be explicitly represented. First, the events must be self-related so the self must be represented as an agent in the episode. Second, the episode must be understood to be distinct from the present, so some kind of temporal marking must be included. There is now evidence from children's language that both aspects are present around the beginning of the third year of life. A number of studies have examined children's joint reminiscing with parents and provided good evidence that by three years children appear to be able to contribute to conversations about previously experienced events (e.g., Fivush, Gray, & Fromhoff, 1987; Reese, Haden, & Fivush, 1993; see chapter 14). However, a conservative interpretation of these findings is that because the children's recall is typically cued by the parents, it is less dependent upon true episodic memory (see Tulving, 1972, 1985). Therefore, here, we draw instead on the intensive and revealing analyses of the spontaneous, uncued, crib monologues of one particular child, Emily, from the age of 21 to 36 months reported in a collection of essays edited by Nelson (1989c).

In a chapter (Nelson, 1989a) in that edited volume, Nelson analyses Emily's crib monologues in terms of the expression and construction of the "self in time." Nelson argues that during this period Emily "grapples...[with the problem of]...how to situate herself within the world of other people engaged in activities organized in time" (p. 284). Nelson describes how Emily began to represent herself through language as an individual agent participating in events that occur at different points in time.

With respect to self-representation, Nelson reports that Emily initially had a differentiated set of terms to refer to herself—I, my, and Emmy/Emily—in the subject position of her utterances. Of particular interest is the fact that these different

forms were initially used for different contexts. Before 24 months, when Emily talked of herself in current, ongoing activities or in the context of immediate wants and needs, she used *I*, and this usually occurred in dialogues with others. However, in her monologues, when she referred to herself as the actor in a noncurrent event, she used *Emmy* or *Emily*. This differentiated usage is intriguing because it suggests the possibility that initially the self is represented differently in current and noncurrent events. In current events, the self is expressed more from a first-person point of view—as an actor and experiencer—whereas, in noncurrent events, the self is represented more from a third-person point of view.

Over the next 4 months, the use of these forms of self-reference changed significantly. By 28 months, the use of *Emmy* or *Emily* for self-reference in noncurrent episodes had dropped off almost completely, replaced largely by the use of standard first-person forms *I* and, to some extent, *we*. So, by the middle of the third year, even in her references to the self in noncurrent events, Emily used a standard form, consistent with adult usage, which suggests a representation of the self in the past as involving integrated first- and third-person perspectives. This is the emergent episodic self.

The linguistic marking of temporal displacement has a number of facets and is only gradually acquired over a protracted developmental period during the preschool years. Many of these facets reflect the awareness of how events are organized in relation to each other in time. For example, verb tense and temporal markers, such as "yesterday" and "tomorrow," distinguish past, present, and future events, as well as how events may be organized within the past or within the future (see Weist, 1986, on the difference among speech time, event time, and reference time). For our purposes, we may ask, is there sufficient evidence that very young children are able to bring to mind, or attend in imagination, to noncurrent events? Emily's monologues provide ample evidence that, from the earliest monologues, she was. The following monologue excerpt referring to an event in which one of the family cars broke down, provides an early example (Emily at 21 months, seven days).

car broke
the... Emmy can't go in the car
go in green car
no
Emmy go in the car

broken, broken
 their car broken
 so Mommy Daddy go in their their car
 Emmy Daddy go in the car (Nelson, 1989b, p. 64)

Notice that even though this excerpt refers to a past event, there is no explicit marking in the monologue of the event as noncurrent. So it is entirely possible that Emily is attending in imagination to a noncurrent event but is not aware of it as an event from the past. In short order, however, Emily developed productive control over a variety of forms of temporal marker, including verb tense and temporal adverbials, which strongly suggests an awareness of the noncurrentness of such events. For example, in reference to a sleepover, Emily (23 months, eight days) said:

yesterday did that
 now Emmy sleeping in regular bed
 yesterday my slept, and um
 and in Tanta house
 and Mommy woke my up
 and go, time to go home (Nelson, 1989b, p. 71)

In this example, Emily clearly distinguishes the past event in which she slept at “Tanta house” from the current situation in which she is sleeping in her “regular bed.” There is therefore a demarcation of past from current and the ability to attend to the past event in a particulate self-related way.

Utterances oriented to the future also appear in Emily’s monologues, likely based on what she had been told about upcoming events or her growing event knowledge. For example, at 32 months, Emily said:

tomorrow, when we wake up from bed,
 first me and Daddy and Mommy
 you eat breakfast . . .
 like we usually do
 and then we’re going to p-l-a-y
 and then soon as daddy comes
 Carl’s going to come over
 and then we’re going to play a little while (Nelson, 1989b, pp. 68–69)

Given the use of the future indicator, “tomorrow,” as well as the use of the future progressive, “going to,” this sequence suggests that Emily is imagining events involving the self and marking them as to occur in the future. Further examples of young children’s future-oriented language in conversation with parents may be seen in Hudson (2001). From their analyses of these kinds of utterances in the

monologues, Nelson (1989b) and Gerhardt (1989) have argued that Emily moves from marking a broad distinction between current and noncurrent to differentiating past, present, and future. In any case, it is evident from Emily’s monologues that even very young children are not limited by their imagination to immediate and ongoing events.

Notwithstanding the obvious caveat that she was clearly a highly articulate and verbally precocious child, we suggest that these observations of Emily’s crib monologues, combined with ample evidence from other larger sample studies of parent–child reminiscing (Fivush et al., 1987; Hudson, 2001; Reese et al., 1993), provide clear evidence that beginning at the end of infancy, children are able to bring to mind particular noncurrent events and represent the self as part of those events. In effect, then, by the onset of the preschool period, children are able to engage in a form of episodic thinking, and may be said to have an episodic self.

Connecting the Self in Time

Whereas the episodic self involves the ability to imagine particular noncurrent events involving the self, the temporally extended self, at least as we have defined it, involves coordinating those particular events together in such a way that the contingent and causal relations among them are recognized. Thus, the temporally extended self involves understanding not just that the past self or the future self is different from the current self, but that these noncurrent selves are connected to the present self—that the events involving the past self have implications for the present self and that the events involving the present self have implications for the future self. Our argument is that this ability comes slightly later, and is robust only toward the end of the preschool period as an increasingly imaginative or representational flexibility arises (Perner, 1991). A variety of phenomena support this conclusion and we review some of them here.

Coordinating Past and Present Selves

One line of relevant research was mentioned earlier in the chapter. Povinelli and his colleagues (e.g., Povinelli et al., 1996) conducted a number of studies showing that delayed self-recognition develops rather later than mirror self-recognition. In addition to the finding that four-years-olds but not younger children pass the delayed self-recognition task, they also showed that the amount of time that has passed between the marking and test events is an important determinant of whether older children will search

for the mark (Povinelli & Simon, 1998). To demonstrate this, they tested children at three and five years. The children were marked surreptitiously with a sticker on the head while being videotaped with the knowledge that they would watch the video at a later point in time. The children watched the videotape either a few minutes later or after an interval of a week. The older children searched for the sticker when they watched the videotape after the brief delay but not after the long delay. In contrast, the younger children tended not to search for the sticker, but when they did it was just as likely to happen after the long delay as after the brief delay. It was only the older children, therefore, who appreciated the different implications of the long and short delay for the likelihood of finding the sticker. This finding suggests that older preschoolers have an understanding of how the self is laid out in time and particularly how current self depends on events that have occurred to the prior self at different points in time. This is the hallmark of the temporally extended self.

Delayed self-recognition reveals awareness of the temporally extended self in terms of its outward appearance, but the temporally extended self involves more than just outward appearance. It also involves an awareness of the ways in which psychological experiences are connected through time. Within the literature on theory of mind, various studies have examined when children begin to understand that their current belief or knowledge states are affected by prior experience. For example, in one of the classic versions of the false belief task (e.g., Perner, Leekam, & Wimmer, 1987), children are presented with a box, such as a candy or band-aid box, that initially misleads them as to its contents. They are then shown that the contents differ from what was expected—the band-aid box contains pencils, for instance. Finally, the children are asked what they previously thought was in the box. The well-replicated result is that children younger than four years routinely say they previously believed there were pencils in the box, whereas older children happily confirm that they previously thought there were band-aids but now know there are pencils (Gopnik & Astington, 1988; Moore, Pure, & Furrow, 1990). This result suggests that for younger children current knowledge dominates awareness, whereas older children can imagine at one and the same time both the current and the former belief.

Before about four years, children also have considerable difficulty appreciating how their current knowledge state was acquired from their prior

experience (e.g., O'Neill, Astington, & Flavell, 1992; O'Neill & Gopnik, 1991; Perner, Kloo, & Gornik, 2007). For example, O'Neill and Gopnik (1991) presented children with a Styrofoam tunnel in which various objects could be placed. On different trials, the children learned the contents by looking in the tunnel, reaching in and feeling the object, or being told by the experimenter. Having discovered the contents, the children were asked by the experimenter how they knew what was inside the tunnel ("Did you see it, did you feel it, or did I tell you?"). Compared with four- and five-year-olds, three-year-olds were very poor at recalling the source of their knowledge. This result reveals how older children become aware that their current knowledge is directly connected to the particular kind of experience previously encountered.

In different ways the studies reviewed in this section demonstrate that it is not until about four years of age that children appear able to appreciate that their current state, either physical or mental, depends upon their prior episodic experiences. Therefore, it appears that younger children can remember such prior episodes but they do not integrate them into a self that has continuity across time.

Connecting Present and Future Selves

In recent years, there has been considerable growth in research on future-oriented thinking in children. This chapter does not review this body of work in detail because it is covered thoroughly in chapter 20. Here we highlight certain findings that we believe are particularly significant as evidence for the temporal extension of the self into the future.

Some have argued that selecting an object for future use is the clearest demonstration of imagining future circumstances involving the self (Russell, Alexis, & Clayton, 2010; Suddendorf & Busby, 2005; Tulving, 2005). Indeed, this approach has been the preferred strategy for examining future-oriented behavior in nonhuman primates (e.g., Mulcahy & Call, 2006; Osvath & Osvath, 2008). The general rationale is that if the target object is currently of no use to the participant but will become useful for some later situation in which the participant will find him- or herself, then choosing that object may well indicate the ability to imagine the self in that future situation. Suddendorf and Busby (2005) examined whether children would take certain puzzle pieces with them to a different room that only contained a puzzle; they found that by four to five years children did indeed anticipate their future play needs in this way. Russell et al. raise the

concern that participants could perhaps choose the correct object because they *know* what is required for the future situation not because they *imagine* themselves in that future situation. Consequently, they used a similar approach, but compared performance in two versions of such a task—one in which children were asked what they would need in the future and the other in which they were asked what another person would need in the future.

The task devised by Russell et al. (2010) involved a blow-football game for which children were asked which two of six possible objects should be chosen to play a game the next day. Only two of the objects were critical, the other four were foils. As noted, of particular interest, children were either asked to make these choices for themselves or for another child. In comparison control conditions, children were asked which objects should be chosen to play the game immediately. In the control conditions children from three to five years reliably chose the correct objects with no difference according to age. By five years of age children were reliably able to make the right choices for both the self and other future conditions. However, younger children performed significantly better on the other-future condition than on the self-future condition. Although this result is perhaps counterintuitive in that one might predict it would be easier to solve the task for the self rather than for another person, Russell et al. (2010) suggest that for the other condition, children tend to answer the question in a temporally neutral way and this is supported by the finding that there was no difference between performance in the other-future condition and in the other immediate condition. In contrast, before five years, children performed significantly worse in the self-future condition than in the self-immediate condition. The authors argue that in the self-future condition children attempt to imagine themselves in the future situation but at least for the younger children their attempts fail.

The other approach that has been employed to assess the development of the self temporally extended into the future is the delay of gratification choice paradigm (Mischel, 1974; Moore, 2010; Moore, Barresi, & Thompson, 1998; Lemmon & Moore, 2007; Thompson, Barresi, & Moore, 1997). In this task, children choose over a series of trials between smaller or otherwise less desirable rewards available immediately and larger or otherwise more desirable rewards available at some later time. Importantly, the choice paradigm differs from the maintenance delay of gratification paradigm in

which the length of time children are able to wait for a reward is the measure of interest (Mischel, 1974). In the choice task, children have the opportunity to allocate rewards to both their current and future selves and so it provides a window onto how the interests of the current and future selves are valued relative to each other. The task can therefore be conceived to measure future-oriented prudence, which has been argued (e.g., by Nagel, 1970) to reflect the awareness of the temporally extended self. As Nagel put it:

[prudence] reflect[s] an individual's conception of himself as a temporally persistent being: his ability to identify with past and future stages of himself and to regard them as forming a single life. Failure to be susceptible to prudence entails radical dissociation from one's future, one's past, and from oneself as a whole, conceived as a temporally extended individual. (p. 58)

Studies using this assessment of future-oriented prudence have shown robust developmental differences such that three-year-olds typically opt for the immediately available rewards, whereas older preschoolers will choose the larger, delayed reward at least some of the time (Mischel, 1974; Thompson, Barresi, & Moore, 1997). For example, Thompson, Barresi, and Moore (1997) tested children at three, four, and five years of age on a task in which the children were rewarded with stickers that could be placed in a sticker book. Over a series of trials the children could choose between one sticker immediately or wait until the end of the session to receive two stickers. Three-year-olds opted to take the single sticker immediately on most trials. In contrast, both four- and five-year-olds opted to delay for the greater reward significantly more often.

One concern that has been expressed over the use of this prudence task as a measure of young children's ability to imagine the future self is whether the developmental differences between younger and older preschoolers reflect differences in the temporally extended self or in motivation (see Atance & O'Neill, 2001; Russell et al., 2010). Perhaps younger children are able to imagine their future circumstances and the link between their present action and the future, but they are less future oriented than older children and simply prefer to take the rewards immediately, perhaps because of limitations in executive function (see chapter 11). To examine this possibility, Lemmon and Moore (2007) presented three- and four-year-olds with choices in which they could gain one sticker

immediately or two, three, four, or five stickers later. The reasoning was that if younger children simply weighted the value of immediate and future rewards differently from older children, then the younger children should start to increase their future orientation as the differential between immediate and future rewards increased. In fact, the results showed that for three-year-olds it did not matter whether they were to receive two stickers in the future or five stickers in the future, they still opted to take one immediately. In contrast, older four-year-olds opted to delay on trials in which five stickers were at stake much more often than on trials in which only two stickers were available. Therefore, only the older children adapted their decisions according to the relative value of the future reward and thus appeared to be considering the future in a manner quite different from the three-year-olds. This result is consistent with the idea that three-year-olds are not able to imagine their future interests in contrast to their immediate interests, and therefore they are not able to make prudent decisions in favor of the interests of their future selves. Together these results on future-oriented prudence show that younger children tend to be fixed in their immediate perspective—they want the reward now—whereas older children are able to take a more objective stance on the decision and consider the interests of their future selves as well as their current selves.

Binding the Self in Time

We have described two sets of studies on the development of children's temporally extended self—one set investigating children's ability to coordinate the present with the past self, the other examining their ability to coordinate the present with the future self. Both sets of studies point to about four years as the time at which children become capable of coordinating the present with the nonpresent self. On the grounds that the temporally extended self spans past, present, and future, a few studies have explored whether success on these two kinds of tasks is correlated. So it is of interest to consider whether children's ability to connect past and present states of the self develops in line with their ability to consider their present and future self states together. Lemmon and Moore (2001) tested three- to four-year old children on both delayed self-recognition, using Povinelli and colleagues' task (Povinelli et al., 1996) as a measure of the connection between the past and the present, and future-oriented prudence as a measure of the connection between the present and the future. They found performance on these two tasks

was significantly correlated. Children who showed self-directed behavior in the delayed self-recognition task also tended to opt for the greater future reward when presented with a choice between rewards now or later. Using quite different measures, Busby and Suddendorf (2005) examined whether there would be a correlation between children's ability to recollect self-related events from the past and imagine self-relevant events in the future. They found that indeed children who could do one tended to be able to do the other and that this correlation was independent of general verbal ability. These findings support the idea that, at about four years of age, children do indeed develop a temporally extended self that spans past, present, and future.

The Role of the Imagination in the Temporally Extended Self

As some others have argued (e.g., Povinelli, 1995, 2001), we suggest that the acquisition of a temporally extended self that spans past, present, and future depends on a relatively general change in imaginative abilities at about four to five years (see, for example, Olson, 1993; Perner, 1991). This change enables children to imagine two or more different ways of thinking about the same thing and distinguish them as representations of the same thing. It is a general change because it has implications for many aspects of cognitive development—perspective-taking, the appearance–reality distinction, theory of mind. All of these phenomena develop at about the same age and all involve being able to think about or represent one thing—view, object, mental state—in two distinct and potentially conflicting ways, and, if necessary, relating them. The temporally extended self also requires this form of imagination. It depends upon the ability to think about the self as existing in multiple, distinct ways.

However whereas these phenomena are sometimes interpreted to show how children become able to think about the same object or event in two or more distinct ways, without necessarily relating them, the temporally extended self also depends upon the recognition of the relation of *continuity* among multiple temporally distinct representations. We argue that this recognition of continuity is made possible because self-representations have an integrated first- and third-person nature. The current self is primarily known from a first-person point of view, but there is an integrated awareness also of the third-person point of view. In two-year-olds this third-person perspective is also current, and the infant has only a current integrated conception of

self. However, with increasing awareness of episodic selves from past and future, as well as an appreciation of time, noncurrent integrated selves are also represented from both a first- and a third-person point of view. However, it is only in four-year-olds that continuity between these episodic selves becomes a possibility, and a temporally extended self that binds the past, present, and future is formed. Thus, noncurrent self-representations have the same quality, the same “look and feel” of the current self. As John Locke recognized many years ago, it is the re- and pre-experiencing of the self from differing points in time that provides the common currency for these self-representations to be integrated across time.

Conclusion

We have argued that, despite its apparent immediacy, the self depends upon the imagination in different ways. The first awareness of the self as an individual person, distinct from others yet similar to them, requires imagination of the self from an outer, or third-person perspective, in coordination with the experience of the inner, or first-person perspective. The individual self is an integrated representation that combines these two perspectives. When the child is presented with an external experience that only contains third-person information, such as a mirror image of the self, this information is known in terms of an integrated first- and third-person representation. Similarly, internal first-person experience of the self provided by current action is also known in terms of an integrated first- and third-person representation. Because both experiences are represented in the same way, they can be related to each other such that the external experience is understood as the same thing as the internal experience.

The self as a continuous person requires the translation of the gains made during the second year into the temporal domain through further development of imagination. The imagination makes possible the representation of noncurrent states of self as integrated first- and third-person while at the same time maintaining an awareness of the current state of self. Simultaneous representation of current and noncurrent states of self in their temporal and causal relation to each other enables the union among these self-states into a single enduring whole. Now, the self is known not only as an individual self, like others and yet distinct, but also as a continuous self, for which each state of the self is distinct in time yet also connected as part of a temporally extended entity.

In this chapter, we have sketched an analysis of the self both as individual and as temporally continuous, and pointed to its dependence on the imagination. In so doing, we have intentionally focused on individual psychological processes, while neglecting the role of other influences. However, we would not wish to give the impression that the self arises purely in this way or that these psychological processes operate in a vacuum. There is a long intellectual tradition that points to the role of social influences on the construction of the self (e.g., Martin, Sugarman, & Hickinbottom, 2010; Mead, 1934). We strongly believe that such influences must be taken into account. However, whereas too often in theory individual and social influences have been put in opposition to each other, we believe that the way forward is to map out how social influences work through the operation of individual psychological processes, such as the imagination, in the development of self. Here we point to two examples that illustrate this combined influence.

First, as we described earlier, in coming to represent the individuality of the self, children must take an imagined third-person perspective on the self. The adoption of a third-person perspective on the self is made possible because children exist in a social environment in which they are constantly engaged in social interactions during which others are continuously directing their activity toward them. Children experience continuously other people looking at them, talking at them, emoting toward them, and so on. In these interactions, the self is the object of the others' intentional relations, so once the child can imagine others' intentional relations, it follows that he or she must also become able to imagine the self as the object of intentional relations. In this scenario, the objectification of the self as an individual entity depends critically on the exercise of the imagination within social interactions. Indeed, Gillespie (2010) has recently combined this kind of third-person approach to self-objectification in the second year of life based on the earlier theory of Barresi and Moore (1996) with a neo-Meadian account of position exchange and imagination in play so as to provide a general social account of human agency.

The second example was alluded to earlier in the context of the development of the continuous self. There is now considerable evidence that it is, at least in part, through joint reminiscing with others that children become able to engage in episodic thinking (Fivush, Gray, & Fromhoff, 1987; Reese, Haden, & Fivush, 1993; see chapter 14). Through

the preschool period, children start to participate in conversations about previous and possible future events involving the self. The conversation helps to concretize in imagination those noncurrent events involving the self and also to link them to the current self. So again, it is the exercise of the imagination encouraged through social interaction that helps to establish the self, now as a temporally continuous entity.

We believe that further progress in our understanding of the self must attend to both intrapersonal psychological **process** such as imagination and interpersonal processes occurring in social interaction and discourse. Although Descartes was wrong to think that the self could be immediately known and was the fulcrum upon which all other knowledge must be built, he was right to think that the self as a concept is central to human experience. However, its centrality is not owing to its role at the foundation of all true knowledge, but to its role at the center of human social life. Indeed, without this concept of self constructed in the imagination that centers us within our social life, we would scarcely be human at all.

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