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The relationship between theory of mind and episodic memory: Evidence for the development of auto-noetic consciousness

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Abstract

The study investigated a link between theory of mind and episodic memory involving auto-noetic consciousness (Tulving, 1985). Eighty-nine Japanese 4- to 6-year-olds received two versions of a false belief task, a task of aspectuality or knowledge origins, and four memory tests. After controlling for age, most theory of mind abilities showed no interrelations, and own and other's belief understandings in deceptive appearance tasks were solely related to source memory, but not to free recall, temporal ordering, or working memory. Moreover, even when age and verbal intelligence were controlled, the association between representational change and source memory was highly significant in 6-year-olds but not in 4- and 5-year-olds. Results suggest that during development only a particular kind of theory of mind ability is integrated with episodic memory.

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Introduction

In much recent literature on both adult memory and child cognition, theories of episodic memory have been proposed, especially from the perspective of subjective awareness or consciousness involved in memory phenomena (Perner, 1990, 2000;

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Suddendorf & Corballis, 1997; Wheeler, Stuss, & Tulving, 1997). As originally proposed by Tulving (1985), there is a distinction between remembering and knowing that accompanies conscious recollections of past events. The remembering, or episodic memory, of an event depends on auto-noetic (self-knowing) consciousness that we have subjectively thought or experienced it before; whereas knowing, or semantic memory, of an event entails noetic (knowing) consciousness that we know or objectively think about it without the additional recollective awareness. In an elaboration of Tulving's framework, Wheeler et al. (1997) considered episodic memory as a highly evolved human capacity not only to mentally travel back in one's personal past but also to mentally project anticipated events into one's subjective future (see for a similar discussion, Suddendorf & Corballis, 1997).

On the basis of Tulving's (1985) distinction of consciousness involved in memory, Perner (1990, 1991, 2000) hypothesized that episodic memory development was dependent on children's developing theories of mind (i.e., abilities to understand mental states such as thoughts and beliefs and to impute them to people). Perner postulated that before the age of 4 or 5 years when children do not yet reflect on the perceptual origin of their own knowledge, they cannot encode events as personally experienced (see also, Welch-Ross, 1995). Episodic memories emerge only with the development of what Perner (1990) labeled "experiential awareness"—a state of consciousness similar to auto-noetic consciousness. In support of this hypothesis, Perner and Ruffman (1995) found that 3–6-year-olds' ability to understand the informational relation between knowledge and sensory experiences (as reflected in performance on theory of mind tasks) was related to free recall, even when cued recall and verbal intelligence were controlled.

The possibility of a link between theory of mind and memory has recently attracted researchers' attention, especially in the field of children's suggestibility (i.e., biasing effects of incorrect, postevent information on their memory of the original events). Welch-Ross, Diecidue, and Miller (1997) demonstrated that 3–5-year-olds' theory of mind ability predicted their suggestibility (see Welch-Ross, 1999, 2000, for related results). Templeton and Wilcox (2000) also found that the amount of suggestibility in 6-year-olds was influenced by their theory of mind ability, whereas that in 3- and 4-year-olds was not. These results strongly indicate a link between theory of mind and children's mnemonic ability to resist being misled by incorrect information. However, the existing evidence from suggestibility effects has not been concerned with recollective awareness that accompanies the memory phenomena. There has been virtually no study except Perner and Ruffman's (1995) that directly examined the relation between theory of mind and memory from the aspect of auto-noetic consciousness. The present study examined the relation focusing on this particular kind of recollective awareness.

In conducting such a study, it is important to include a range of measures of theory of mind. In the past, children's theory of mind abilities have been assessed by a wide variety of tasks. The most widely used are two types of traditional false belief tasks that measure the ability to understand representations. One is an unexpected transfer task (Wimmer & Perner, 1983) in which an object put by a protagonist in one place is transferred to another place without the protagonist's awareness and

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