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# The relationship between preschoolers' selective attention and memory for location strategies

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## Abstract

Late and early preschoolers' attention and spatial strategies were examined in response to instructions to recall relevant objects [Blumberg, F. C. & Torenberg, M. (2003). The impact of spatial cues on preschoolers' selective attention. *Journal of Genetic Psychology*, 164, 42–53] and irrelevant objects [Blumberg, F. C. & Torenberg, M. (in press). The effects of spatial configuration on preschoolers' selective attention and incidental learning. *Infant & Child Development*], and to spatial placement of objects within a multi-colored box. Sets of toy chairs or animals were designated as relevant or irrelevant and placed in each of the box's corners (corners condition), in the middle of its walls (walls condition), or in two corners and in the middle of two walls (control condition). Selective attention and spatial strategies were assessed via the removal sequence of items. Recall was assessed via correct relocations of relevant items. Older children and corners condition children showed significantly better recall than children in other conditions. Overall, most children used selective strategies, indicating that relevance of items, rather than their spatial categorization as corners or walls influenced strategy choice. © 2005 Elsevier Inc. All rights reserved.

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## 1. Introduction

Selective attention is defined as the ability to filter out irrelevant or distracting information from that which is more central or relevant to a given task. Findings consistently demonstrate

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that the strategies children use to selectively attend become more effective in terms of the relevant information recalled during middle childhood (Druker & Hagen, 1969; Hagen & Hale, 1973; Hale & Piper, 1974; Hale, Taweel, Green, & Flaughner, 1978; Lane & Pearson, 1982). Specifically, strategies progress from those based on the spatial configuration of information (spatial strategies) in the preschool years (Woody-Ramsey & Miller, 1988) to those based on the relevance of information (selective strategies) during the middle elementary school years (DeMarie-Dreblow & Miller, 1988; Miller, 1990).

Direct assessments of children's selective attention and attention strategies have primarily relied on the selective memory task developed by Miller and Weiss (1981). This task is a derivation of an incidental learning task developed by Hagen (1967) and based within the incidental learning paradigm that was used extensively during the mid-1960s and 1970s to study children's selective attention. The major assumption of this task is that selective attention involves greater learning about relevant information and less learning about the irrelevant information. More recently, Miller and her colleagues have used this task to examine children's selective attention strategies. Specifically, children are presented with a two by six array of pictures representing two categories of information, typically animals and household objects. They are then told to study one category of pictures so that they will be able to later recall their positions within the array. Each picture can only be viewed by lifting a door on which a line drawing indicates the category whose exemplar is depicted underneath. A child's pattern of lifting the doors during the study periods for each trial provides an assessment of the attention strategies used. Thus, lifting only the doors corresponding to information to be recalled later is a more selective strategy than lifting all doors randomly. Recall of the locations of the category exemplars provides a separate measure of recall for central task information (reflecting selective attention) and of irrelevant task information (reflecting incidental learning). These assessments, of necessity, confound attention with memory for location.

Children's performance on the Miller task provides evidence for a developmental sequence of selective attention strategies whereby strategies are governed by spatial configuration or spatially-oriented strategies (e.g., opening all doors by row) and less efficient during the preschool years, and more selective (e.g., opening only relevant doors) and efficient during the elementary school years (Miller, 1990). Moreover, the findings from this task typically indicate that during the early elementary school years, children's selective attention is less sophisticated than is demonstrated by their overt strategic behavior. This pattern of behavior reflects a utilization deficiency, characterized by Miller (1990) as a developmental lag between strategic implementation and beneficial performance resulting from that implementation. According to Miller and Seier (1994), utilization deficiencies may reflect transitions in strategy development from effective strategy use exclusively to effective coordination of strategy use and performance.

Thus, young children's use of spatially-based strategies in the context of selective attention tasks may serve as a harbinger of more sophisticated and consistently efficient strategies. One also may hypothesize that children's spatial strategies reflect early iterations of selective strategies given the relative sophistication of spatial ability during early childhood as opposed to relative cognitive immaturity of selective attention during the same developmental period (see Miller, 1990). Support for this hypothesis may be found in Miller and her colleagues' demonstrated developmental hierarchy of strategies as noted above. Thus,

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