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Cross-cultural differences in cognitive development: Attention to relations and objects

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ABSTRACT

Growing evidence indicates a suite of generalized differences in the attentional and cognitive processing of adults from Eastern and Western cultures. Cognition in Eastern adults is often more relational and in Western adults is more object focused. Three experiments examined whether these differences characterize the cognition of preschool children in the two cultures. In Experiment 1, 4-year-olds from the two cultures ($N = 64$) participated in a relational match-to-standard task in two conditions, with simple or richly detailed objects, in which a focus on individual objects may hurt performance. Rich objects, consistent with past research, strongly limited the performance of U.S. children but not Japanese children. In Experiment 2, U.S. and Japanese 4-year-olds ($N = 72$) participated in a visual search task that required them to find a specific object in a cluttered, but organized as a scene, visual field in which object-centric attention might be expected to aid performance and relational attentional pattern may hinder the performance because of relational structure that was poised by the scene. U.S. children outperformed Japanese children. In Experiment 3, 4-year-olds from both cultures ($N = 36$) participated in a visual search task that was similar to Experiment 2 but with randomly placed objects, where there should not be a difference between the performance of two cultures because the relational structure that may be posed by the scene is eliminated. This double-dissociation is discussed in terms of implications for different developmental trajectories, with different developmental subtasks in the two cultures.

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Introduction

Classic theories presume that development—at least in its broad strokes—is universal across cultures. However, there is growing evidence of cross-cultural differences in adults in behavioral studies (Chiao & Blizinsky, 2010; Kim et al., 2010), cognitive studies (Chua, Boland, & Nisbett, 2005; Kitayama, Duffy, Kawamura, & Larsen, 2003; Masuda & Nisbett, 2001, 2006; Masuda et al., 2008; Nisbett & Masuda, 2003; Nisbett & Miyamoto, 2005; Nisbett, Peng, Choi, & Norenzayan, 2001), and neural studies (Han & Northoff, 2008; Hedden, Ketay, Aron, Markus, & Gabrieli, 2008). The developmental origins and timing of these differences is clearly important to understanding the role of culture in cognition and to understanding the developmental process more generally (e.g., see Kuwabara, Son, & Smith, 2011; Moriguchi, Evans, Hiraki, Itakura, & Lee, 2012; Richland, Chan, Morrison, & Au, 2010). Here, we report new evidence on cross-cultural differences in preschool children's performances in two tasks: attention to relations in a relational matching task and attention to individual objects in a search task.

The cross-cultural question

Western and Eastern cultures appear to differ in the degree to which they emphasize decontextualized versus contextualized interpretations of objects (Masuda & Nisbett, 2001, 2006; Nisbett, 2003; Nisbett & Miyamoto, 2005; Nisbett et al., 2001). For example, in one study, adults from the United States and Japan were asked to describe an aquarium (Masuda & Nisbett, 2001). The U.S. participants described the large fish in the center of the display. The Japanese participants described the central fish in *relation* to peripheral components (e.g., water color, plants, small fish). This difference between more individual object focused attention in Westerners and more relational attention in Easterners has been documented in a variety of tasks, including perceptual, social, and reasoning tasks (Chua et al., 2005; Ji, Peng, & Nisbett, 2000; Kitayama et al., 2003; Masuda & Nisbett, 2001, 2006; Masuda et al., 2008; Nisbett & Masuda, 2003; Nisbett & Miyamoto, 2005; Nisbett et al., 2001; Richland, Zur, & Holyoak, 2007).

Some findings suggest that cultural differences in perceptual and cognitive tasks begin early. In the rod and frame task, 6-year-old Japanese children's judgments of rod length were more influenced by the size of a surrounding frame than were the judgments of their U.S. counterparts (Duffy, Toriyama, Itakura, & Kitayama, 2009). In a task asking children to match facial expressions to emotions, 4-year-old Japanese preschoolers were influenced by the context (happy or scary event), whereas U.S. preschoolers interpreted emotional state as a more trait-like property of the individual (see also Ji, 2008, and Lockhart, Nakashima, Inagaki, & Keil, 2008, for related findings with school-age children). Finally, in a recent study particularly relevant to the current one, Richland and colleagues (2010) reported that 4-year-olds in Hong Kong were better able than U.S. children to map relational roles across pictures of everyday events. In brief, although the number of studies with young children is as yet limited, they consistently point to cross-cultural differences in preschoolers that are like those in adults in implicating a Western cognitive system biased toward decontextualized objects versus an Eastern system biased toward objects in relation to context.

Objects and relations

When one views a scene, one can focus on an individual decontextualized object or on the relational structure within the scene as a whole, and the cross-cultural evidence (Masuda & Nisbett, 2001) suggests that adults from Western and Eastern cultures are differentially biased with respect to these options. Bias to emphasize objects as individuals versus sensitivity to relational structure has also played a role in theorizing about the development of relational reasoning (Gentner & Rattermann, 1991; Rattermann & Gentner, 1998). The key results—primarily on studies of Western children but using a variety of experimental tasks—suggest an early emphasis on objects and their individual properties and a sensitivity to relational structure that emerges and becomes more robust during the late preschool period (Brooks, Hanauer, Padowska, & Rosman, 2003; Enns & Cameron, 1987; Goswami & Brown, 1990; Kotovsky & Gentner, 1996). The overall developmental pattern fits Gentner's (1988)

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