

Executive Control within Strategic Deception: A Window on Early Cognitive Development?

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Recently it has been claimed that the difficulty young children have with tests of strategic deception may be due to limitations in executive control rather than lack of insight into mental concepts. In the studies reported here we asked how reducing the executive demands of one measure of strategic deception, the windows task (J. Russell, N. Mauthner, S. Sharpe, & T. Tidswell, 1991), would affect performance. Study 1 demonstrated that both providing an artificial response medium and having children play in partnership enabled 3-year-olds to adopt a successful strategy. Study 2 examined whether social or executive factors accounted for the good performance of children when they played in partnership. Study 3 ruled out the possibility that the effectiveness of the artificial media was a result of reducing social intimidation—the manipulations were effective even in the presence of the opponent. These results argue for executive factors playing a substantial role in the development of strategic deception. © 2001 Academic Press

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The development of strategic deception in young children claims our attention for at least two reasons. First, if children perform a deceptive act in order to change the behavior of another person via a manipulation of his or her mental states, they can be said to be recruiting a “theory of mind.” That is to say, implanting a false

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belief into the mind of another requires a conception of false belief. Since understanding false belief is taken to be a key criteria for the theory (e.g., Astington & Gopnik, 1991; Perner, 1991; Wellman, 1990; Wimmer & Perner, 1983), studying strategic deception informs us about the acquisition of a theory of mind. If the deceptive act is indeed being performed via a manipulation of another's mental state we would expect strategic deception to have a similar developmental trajectory to that of theory-of-mind tasks such as unexpected transfer, deceptive container, and others (Perner & Lang, 1999). Consequently we would expect little evidence for strategic deception to be found before 4 years of age.

The research literature concerned with the onset of strategic deception skills is contradictory. Some researchers find that children of 3 years of age are incapable of strategic deception (Peskin, 1992; Ruffman, Olson, Ash, & Keenan, 1993; Russell, Jarrold, & Potel, 1994; Russell, Mauthner, Sharpe, & Tidswell, 1991; Sodian, Taylor, Harris, & Perner, 1991). Others, however, find that children well below the age of four can engage in deceptive acts under laboratory conditions (Chandler, Fritz, & Hala, 1989; Hala, Chandler, & Fritz, 1991; Polak & Harris, 1999). Indeed in naturalistic studies children as young as 2 years of age have been found to engage in various kinds of verbal deception (Dunn, 1991, 1994).

We now turn to the second reason for studying the development of strategic deception. In this case one sidesteps the question of whether children are manipulating the mental states of the deceived person or only his or her behavior and focuses on the strategic demands involved in launching a deceptive act. These reduce to two: (1) the need to inhibit reference (verbal or nonverbal) to the true state of affairs at the same time as (2) maintaining in working memory what must be said or done to change the other's belief or behavior. These twin demands of inhibition plus working memory are almost invariably made by tests of "executive functioning"—tests which frequently challenge patients with lesions of the prefrontal cortex (Shallice, 1988). Moreover, while the term "executive functioning" covers many aspects of cognitive control, there is some consensus among developmental researchers at least that these are two core components of executive tasks (see Diamond, 1991; Pennington et al., 1997). In recent years, several researchers have taken up the challenge of developing age-appropriate measures for studying the development of executive control in young children (e.g., Diamond, Prevor, Callender, & Druin, 1997; Hughes, 1998; Kochanska, Murray, Jacques, Koenig, & Vandegest, 1996; Welsh, Pennington, & Groisser, 1991; Zelazo, Carter, Reznick, & Frye, 1997). The emerging consensus points to significant advances in executive control between the ages of 3 and 6 years. That this developmental time frame corresponds with the emergence of children's theories of mind many researchers claim is not merely coincidental.

Our primary focus in the research reported here was the executive demands of strategic deception. Recently it has been proposed that nearly all of the *mentalizing* tasks that 3-year-olds fail make heavy executive demands (Moore et al., 1995; Russell, 1996, 1997; Russell, Saltmarsh, & Hill, 1999). Given this, studying the contribution of executive factors to the mentalizing tasks which 3-year-olds often

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