

# Minding Controls in Curriculum Study

THE EDUCATION FORUM ON EARLY CHILDHOOD executive functions by A. Diamond *et al.* ("Preschool program improves cognitive control," 30 November 2007, p. 1387) reported an educational intervention congruent with the views of clinicians who believe that intellectual ability emerges from early emotional growth (1). Unfortunately, the conclusions drawn by Diamond *et al.* suffer from evidentiary weaknesses.

A study of this type must reduce differences between groups to those essential to the experimental intervention. Diamond *et al.* reported that teachers trained to use the executive function techniques (EFs) needed almost a year of work before they were proficient; it was not stated how long the comparison teachers took to achieve their criterion. Anxiety about an unfamiliar curriculum might have motivational effects, causing the EF teachers to be more attentive to children's behavior than a less anxious group, as the long-established inverted U-shaped motivational function predicts (2).

The evidence is also weakened by a vague description of the comparison intervention. It is possible that more frequent adult-child interactions occurred in the EF condition than in the other group. More frequent interactions could foster the attachment relationships within which young children are thought to do their best learning. This possibility is reminiscent of the "common factors" concept in the study of psychosocial interventions; some researchers have suggested that common factors influence efficacy more than specific techniques do (3). In the Diamond study, the common factors might be adult-child interactions, and such factors might be the effective causes of changes the report attributes to specific EF techniques.

JEAN MERCER

Department of Psychology, Richard Stockton College, Pomona, NJ 08057, USA.

## References

1. S. I. Greenspan, S. Wieder, *Infant and Early Childhood Mental Health* (American Psychiatric Publishing, Arlington, VA, 2006).
2. R. M. Yerkes, J. D. Dodson, *J. Comp. Neurol. Psychol.* **18**, 459 (1908).
3. A. D. Reisner, *Psychol. Record* **55**, 377 (2005).

## Response

IN HER LETTER, MERCER OFFERS TWO ALTERNATIVE explanations, couched as criticisms, for the findings we reported in our Education Forum (30 November 2007, p. 1387).

Mercer proposed that until teachers became proficient at the Tools of the Mind (Tools) curriculum, anxiety about an unfamiliar curriculum might have caused them to be more attentive to children's behavior than teachers in the comparison program. Our data do not support that hypothesis. By Year 2, teachers in both curricula were proficient, and we found virtually no differences between children who were with these programs in both Years 1 and 2 or only in Year 2. If teacher anxiety accounted for any of the differences, one would have expected a difference in performance between children in Tools who were exposed to anxious teachers (in Year 1) and children in Tools who were not (children who only attended Year 2), but such differences were minor.

Teacher anxiety would likely have increased classroom stress levels, impairing children's ability to master executive function skills or academic content (*I*). Research on the "long-established inverted U-shaped motivational function" referred to by Mercer has consistently shown that although increased anxiety makes individuals more vigilant and attentive to danger signs, it

impairs thinking, problem-solving, and interpersonal sensitivity (2, 3).

Mercer also speculated that perhaps more frequent adult-child interactions occurred in Tools classrooms, which could have fostered attachment relationships. There is no evidence, however, that Tools increased the frequency of adult-child interactions, although it did improve their quality, possibly promoting close positive teacher-student relationships as Mercer suggests. We do not consider that a weakness of our study. Indeed, in supporting online materials (SOM), we said that such intermediate variables might mediate, or contribute to, the observed effects.

Mercer's second suggestion somewhat contradicts her first, for if teachers' anxiety were heightened, that would impair the development of positive relationships with students. A stressed or anxious teacher is less likely to be emotionally present for the children and more likely to snap at children for small transgressions.

I would also like to correct a possible misconception left by the first paragraph of Mercer's letter. As we stated in the SOM,

pages 14 to 15, the beneficial effect of Tools on academic performance might be mediated by its beneficial effects on emotional growth, but we did not investigate, and have no evidence on, its effect on emotional development.

**ADELE DIAMOND**

Department of Psychiatry, University of British Columbia, Vancouver, BC V6N 3L6, Canada.

#### References

1. J. J. Blase, *Am. Educ. Res. J.* **23**, 13 (1986).
2. A. F. T. Arnsten, *Science* **280**, 1711 (1998).
3. S. J. Lupien *et al.*, *Brain Cognit.* **65**, 209 (2007).

## Letters to the Editor

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