E-Letter responses to:

letters:
Patrik Lindenfors;, Phillip Mackinnon;, Angeline Lillard, and Nicole Else-Quest
Studying Students in Montessori Schools
Science 2007; 315: 596b-597b [Full text] [PDF]

E-Letters: Submit a response to this article

PUBLISHED E-LETTER RESPONSES:

Measuring Montessori School Performance

24 May 2007

Patrik Lindenfors, Researcher
Department of Zoology, Stockholm University

Respond to this E-Letter: Re: Measuring Montessori School Performance

In a Letter where I criticized a study evaluating Montessori education (Education Forum, 29 Sept. 2006, p. 1893), I wrote, “Lillard and Else-Quest measured the performance of children from a single Montessori school—a textbook example of pseudo-replication. The only test performed was thus if this particular school is a good school or not” (*1*).

In a subsequent critique of Lillard and Else-Quest’s response to my Letter, J. van Roijen writes that Lillard and Else-Quest (*2*) “do not mention the fundamental rebuttal of Lindenfors´ remark: Lindenfors seems to confuse research to describe a population (the population of Montessori children) and research to establish the influence of an experimental factor (the Montessori system)” (E-Letters, 12 Apr. 2007). That Lillard and Else-Quest do not mention this “fundamental rebuttal” is, however, to their credit, since it is invalid.

In van Roijen’s view, “It would, indeed, have been a textbook example of pseudo-replication if Lillard and Else-Quest had chosen this particular school because of its good performance results.” The problem is there is no way to know if the chosen school had above average, below average or average results, because this was not investigated in the study. This ambiguity of the status of the school and the causes thereof is why it is such a clear case of pseudo-replication.

Moreover, van Roijen compares the study of Montessori children (or the effects of the Montessori system—the error is the same) to studies on inbred mice under controlled laboratory conditions, since both try to “acquire high degree of similarity between the experimental groups.” That the comparison is invalid is perhaps too obvious to need pointing out, but suffice to say neither genes nor environment were controlled for in the original study.

Perhaps the clearest indication of where these statistical pointers come from is given at the end, where van Roijen

states that “to generalize results of analytical experiments is a matter of educated guessing.” Well, no, it isn’t. It is a matter of statistics.

Patrik Lindenfors

Department of Zoology, Stockholm University, Stockholm, Sweden.

References

1. P. Lindenfors, *Science* 315, 596 (2007).

2. A. Lillard, N. Else-Quest, *Science* 315, 596 (2007).

Measuring Montessori School Performance

12 April 2007

Jeroen van Rooijen, Applied animal behaviourist

Respond to this E-Letter: Re: Measuring Montessori School Performance

P. Lindenfors wrote, “Lillard and Else-Quest measured the performance of children from a single Montessori school—a textbook example of pseudo-replication. The only test performed was thus if this particular school is a good school or not” (Letters, 2 Feb. 2007, p. 596). In their Response, A. Lillard and N. Else-Quest (Letters, 2 Feb. 2007, p. 596) do not mention the fundamental rebuttal of Lindenfors´ remark: Lindenfors seems to confuse research to describe a population (the population of Montessori children) and research to establish the influence of an experimental factor (the Montessori system).

The composition of the groups used differs in both types of research. To describe a population, one tries to make the probe representative; one school is probably not. In analytical research, one tries to acquire a high degree of similarity between the experimental groups. A high similarity diminishes the influence of nonexperimental factors. Therefore, for example, strains of genetically near-identical rats and mice are developed. These animals are, for the same reason, raised and kept under controlled laboratory conditions. Lillard and Else-Quest (Education Forum, 29 Sept. 2006, p. 1893) solved this similarity problem elegantly, in a difficult field, by comparing only children that attended the Montessori school lottery.

It would, indeed, have been a textbook example of pseudo-replication if Lillard and Else-Quest had chosen this particular school because of its good performance results. However, these researchers probably chose this Association Montesori Internationale (AMI) Montessori school solely to compare two very similar groups of experimental persons.

To generalize results of analytical experiments is a matter of educated guessing. To prove that the generalization by Lillard and Else-Quest is incorrect, any researcher may replicate this experiment on an AMI Montessori school. However, the results of such experiments, on AMI Montessori and other Montessori schools, may also indicate that this generalization was correct, or even too modest.