LETTERS TO
THE EDITOR

Treatment of a Child With Down Syndrome Cannot Be
Generalized

Edwards and Yuen (May 1990, pp. 454–458) report that their case study "suggests that occupational therapy through
home intervention and the incorporation of neurodevelopmental treatment
and vestibular and tactile stimulation techniques [has] successfully decreased the
decline in the development of a child with Down syndrome" (p. 457).
Generalization from their single-subject pretest–posttest design should be done
with caution, however, for the following reasons.

First, the observed increase in the subject's mental developmental quotient
might have been due, at least partly, to a statistical artifact, regression to the
mean (Kidder & Judd, 1986). The authors determined two scores for their
subject—her mental and motor developmental quotients. The score that
changed upward, the mental one, was initially lower and thus was more likely
to have been affected by regression. The preintervention value may have
been unusually low because of consistent bad luck on the various chance
factors that influence a score, such as distractions during testing. The increase in the
value upon retesting may have resulted from a change to more average luck.

Second, the subject's motor developmental quotient decreased by 7 per-
centage points, as the bottom half of Table 1 (p. 455) shows. Despite interven-
tions intended to promote motor function, its rate of development declined.

Third, the subject was much lower functioning than those in the studies of
Down syndrome that the authors cited (e.g., Dicks-Mireaux, 1972; Hanson,
1981). What is true of such an atypical patient may not be true of other
patients.

Fourth, the research was poorly structured in that it included a number of
factors that could have influenced the findings. The authors used one frame of
reference (neurodevelopmental treatment) and pieces of another (sensory
integration). The treatment took place in two settings and was implemented by
a variety of professionals (direct treatment) and also by a parent (indirect
treatment). Edwards and Yuen judiciously acknowledged that maturation was
yet another factor that may have had an effect. Therefore, if any change
was real, it is not possible to tell which of those factors was responsible.

In addition, the authors, quoting Ayres (1972), state that few precautions
are necessary when providing excitatory vestibular stimulation for a child with
general hypotonia. Pueschel (1988), however, warned that atlantoaxial insta-
Bility affects about 15% of children with Down syndrome, and if it is present,
some vestibular treatment techniques such as somersaults, trampoline ex-
ercises, and roughhousing could injure the neck, causing serious neurological
problems such as difficulties in walking, muscle weakness, and abnormal re-
flexes. Although symptomatic atlantoaxial instabilities are observed in only 1%
to 2% of persons with Down syndrome, the damage can be devastating.

Susan G. Nesbit, MS, OTR
Glen Rock, New Jersey

References
Hanson, M. J. (1981). Down's syndrome: Children. Characteristics and intervention research. In M. Lewis & L. A. Rosenblum (Eds.), The uncom-
non child (pp. 83–114). New York: Plenum.
Pueschel, S. M. (1988, December). Atlantoaxial instability in children with Down syn-

Author's Response
I will respond to Ms. Nesbit's points in the order in which she presents them.

As the title indicated and Nesbit noted, our paper was a case report. The design
was not a single-subject pretest–post-
test, as Nesbit states. Although it is
sometimes difficult to distinguish be-
tween the two, McEwen and Karlan
(1990) stated that in single-subject re-
search, the design controls for threats
to internal validity, thus permitting alter-
native explanations for the finding to
be ruled out and inferences to be made.
In case studies, there are no means to
rule out rival explanations. However, by
limiting threats to the internal validity in
such studies, Kazdin (1981) suggested
that case studies can provide results
that can meet the needs of some purposes
better than empirical research methods
(Barlow & Hersen, 1984). For instance,
the research was often more productive
than single-subject studies for generat-
ing hypotheses, developing educational
materials, and presenting a unique or
unusual occurrence (McEwen & Karlan,
1990). Our case study is accompanied
by a videotape, and both have been used
for instructional purposes. In addition,
enhancing research involving chil-
dren with Down syndrome was
from hypotheses generated from this
study.

Unfortunately, the consistency of
the scores with a preliminary screening
tests, the Denver Developmental Screen-
ing Test, was not mentioned due to edi-
torial exclusion. However, the consist-
cy of the scores with the general clinical observations of experienced cli-
nicians and also the very high inter-
reliability on the evaluations for motor
and mental development with the Bay-
ley Scales of Infant Development admin-
istered by another clinician were report-
ed. Each of these independently
support the results and together indi-
cate that these results are not likely sub-
ject to Nesbit's concern about statistical
artifact or bad luck such as distraction.
Incidentally, one reason the evaluators
gave the home was to limit
distractions.

Regarding the decrease in the sub-
ject's motor developmental quotient,
many reports (Carr, 1970; Dicks-Mi-
reaux, 1966, 1972; Harris, 1981) indicate
that the motor development score de-
clines more than the mental score, even
with intervention (Hanson, 1981). What
did not decline were the motor scores
in age equivalence and the reflex scores,