

Evaluation of the BILL NYE THE SCIENCE GUY
Television Series and Outreach

Executive Summary

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Executive Summary

BILL NYE THE SCIENCE GUY is a widely-viewed, children's television series on science. Designed for eight-to-ten year olds, this series is shown in late afternoons Monday through Friday on PBS stations and on commercial television over the weekends.

ROCKMAN *ET AL*, an independent research group in San Francisco, was contracted by KCTS, Seattle, WA, to undertake an evaluation of the BILL NYE THE SCIENCE GUY television series. The evaluation was charged with exploring the impact of the series on children at home, in school, and in other settings where children can watch television. Both the funders and the PBS station were concerned about science learning outcomes, attitude change, and the impact of the series on girls and minority children.

Background and Methodology:

The study was conducted in three sites—Sacramento, CA; Philadelphia, PA; and the Indianapolis, IN area—representative of the diversity of the viewing audience. At each site, we recruited school viewers and home viewers from rural, suburban, and urban settings for participation, as well as additional, equivalent classrooms who did not watch the series. School and home viewers received a monthly schedule of programs, as well as regular incentives to encourage a high level of viewing throughout the five month study. We provided both viewers in school and at home with twelve BILL NYE programs on videotape as a basic set of programs for viewing. In-school and at-home viewers were asked to watch at least the 12 programs provided.

Participants, both viewers and students in comparison classrooms, completed pre-viewing questionnaires in the early winter, 1995-96, and a second questionnaire in the late spring of 1996. We collected assessment materials from a total of 1,350 children in schools, approximately 800 among the viewing group and 550 in comparison classrooms. We included data from 45 classrooms in 22 schools. Approximately 400 children completed interviews with project researchers at the beginning and end of the study. Children selected for interviews were chosen so as to oversample girls and minority students. Teachers in the viewing and comparison classrooms also

completed questionnaires and interviews, as did parents of participating home viewers.

A study of target-age children viewing in afterschool care settings in the greater Philadelphia region was imbedded in this project. ROCKMAN *ET AL* placed combination television/VCRs into centers with the requirement that the BILL NYE show become a regular, optional activity at the centers. Staff from the centers monitored viewing and maintained the equipment.

Results:

There are substantial outcomes from the set of studies undertaken for this project. Most of our questions focused on critical thinking and the higher-order thinking skills related to exploring and explaining scientific phenomena rather than on children learning facts. Consequently, most of the impact that we were able to capture dealt with thinking skills and the ability of viewers to explain or to identify explanations of scientific phenomena. From the aggregation of findings, we can conclude that viewing the BILL NYE programs does enhance children's science understanding, especially in connection with higher order thinking skills and critical thinking.

Some of the more interesting outcomes are from the hands-on assessments included as part of approximately 400 child interviews undertaken before and after viewing. The improvements we found from these hands-on activities came through enhanced investigative efforts—playing with and observing objects, making hypotheses and trying them out—and with the quality of explanations that children provided to the researchers. On every one of the hands-on assessments, viewers from home or school, or both, increased their active exploration, observation, and hypothesis generation.

Many of our questions derived from demonstrations and experiments from BILL NYE programs and from the teachers' guide and many of the outcomes appear related to the viewing of specific episodes.

From this and from other assessments we can state that:

- Children who view BILL NYE were able to provide more complete and more complex explanations of scientific concepts than they were before viewing the series. But while BILL NYE viewers acquire basic scientific concepts and processes, they often can't transfer principles to other contexts.
- Comprehension and application of science facts and concepts did take place, often as a consequence of information being repeated within programs. Students were able to use facts they had gleaned from viewing as a basis for answering questions.

- There is little change in children's attitudes towards science as a consequence of viewing the BILL NYE series. However, students started with such positive attitudes towards science that little change was likely to appear.
- Girls may not always begin with the same knowledge-base as boys, but they often come nearer to closing the gap after viewing the series. When gains in science knowledge and scientific thinking are seen, girls improve as much or more than boys.
- Where improvements in knowledge and thinking were seen, minority students gained as much or more than majority students. However, these children, too, started with less knowledge than majority children and began to come closer to parity.
- Teachers usually showed the program without a well-defined instructional plan and built a lesson around it. Many of the programs match their curriculum needs and can be useful instructional tools.
- The match between school needs and the broadcast schedule is a barrier to more effective and widespread use in schools.
- According to parents, BILL NYE influenced their children's interests and participation in science activities. Almost all parents (95%) reported that their children undertook a science exploration, experiment or activity over the last few months of the study.
- Watching BILL NYE promoted family interaction; almost all parents (92%) reported watching it with their child at least once and 92% said their child talked to them about the show.
- There is a strong potential audience in the afterschool care setting, especially in structured programs with an emphasis on academics.