

Critical Thinking and a Scientific Worldview: How Students' Thinking May Be Changed Upon Reading The Millennium Man

W. Joseph Wyatt

Marshall University

I wrote *The Millennium Man* (Wyatt, 1997) with several purposes in mind. That readers would develop greater appreciation for a scientific worldview was chief among them. Development of improved critical thinking skills was another. Greater appreciation for the advancements of science and technology (especially in the twentieth century) was one more. And I wanted to accomplish those goals while entertaining the reader.

Embedded within those goals was another—that readers would be more likely to think scientifically about behavior, less likely to succumb to pre-scientific explanations. Thus inoculated, readers would then be inclined to seek answers in the science of behavior analysis, rather than in the occult or the paranormal, or in schools of psychological thought that amount to little more than the paranormal.

This study looked into the changes in thinking of college students who read *The Millennium Man*. It also examined two methods of teaching the content of the novel.

Method

Subjects were college students in a mid-sized college in upstate New York during the 1999–2000 academic year. Students were from two different introductory courses: Psychology and Behaviorology.

Methods of teaching the novel differed from first to second semester. During the first term the instructor, an experienced professor highly versed in behavior analysis, was able to devote only one class period and one long examination to the novel and its extensive study guide (Ledoux, Wyatt, & Bias, 1999). In the second semester, the same professor was able to teach the novel in three class periods, and to divide the long examination into

three shorter exams. The improved understanding of specific principles of behavior, from first to second semesters as measured by the professor's pre- and post-test examinations, are described elsewhere (Ledoux, 2000).

Another kind of pre- and post-test was administered as well. This included several items designed to determine whether the more general goals listed above were being achieved. If students were developing improved scientific worldviews, and better critical thinking skills, it was thought that the following items would provide evidence of those changes:

1. The twentieth century brought about more advancement in science and technology than all other centuries combined.
2. The advancements of science and technology have been beneficial to me personally.
3. There is scientific proof that some people have the gift of extra sensory perception.
4. There is scientific proof that astrology can be accurate.

The above items were rated on the following four-point scale: strongly agree; agree somewhat; disagree somewhat; strongly disagree. "Strongly agree" was the correct response to items one and two. "Strongly disagree" was the correct answer to items three and four.

Results

Figure 1 shows the percent correct (i.e., those who strongly agree) for the statement, "The twentieth century

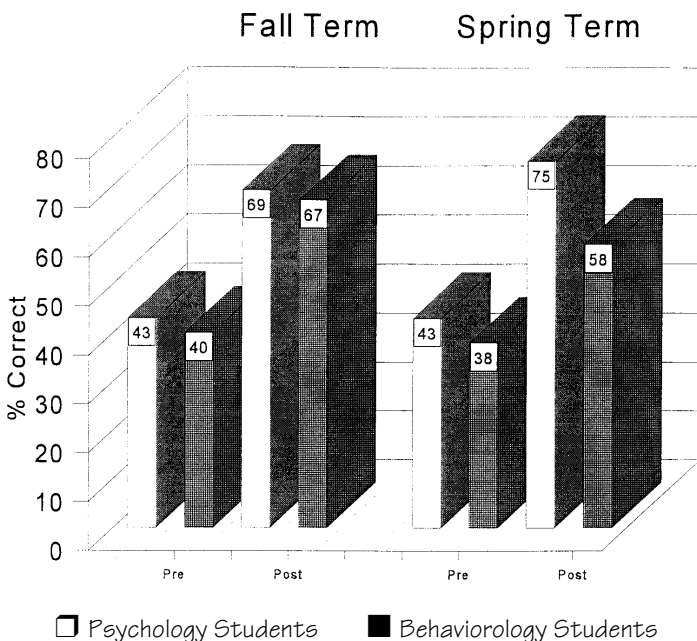


Figure 1: Those who agree strongly with the statement, "The twentieth century brought about more advancement in science and technology than all other centuries combined."

brought about more advancement in science and technology than all other centuries combined." After reading the novel, improvement was evident both for introductory psychology students and for introductory behaviorology students, and this was true for both semesters.

Figure 2 shows the percent correct (i.e., those who strongly agree) for the statement, "The advancements of science and technology have been beneficial to me personally." During the first semester, the percent correct was essentially identical for both psychology and behaviorology students, and did not change as a result of reading *The Millennium Man*. The importance of improved teaching methods is evident, however, in the second term when there was improvement in post-test scores for both groups of students, with behaviorology students improving slightly more than psychology students.

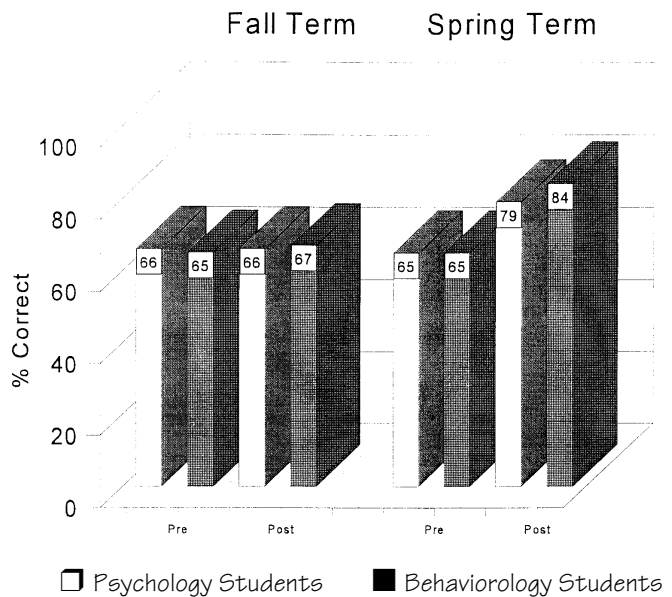


Figure 2: Those who agree strongly with the statement, "The advancements of science and technology have been beneficial to me personally."

Figure 3 shows the percent correct (i.e., those who strongly disagree) for the statement, "There is scientific proof that some people have the gift of extra sensory perception." This result is from an item that deals with the hoped-for goal of improved critical thinking skills. On the first semester's pre-test, only 9% of the psychology students, and only 10% of the behaviorology students, disagreed strongly with this statement. After reading and discussing *The Millennium Man* for one class period, the percent who strongly disagreed quadrupled for psychology students (to 37%) and tripled for behaviorology students (to 33%). During the second term, the proportions of improvement were the same or slightly better (although for reason unknown, the second semester's students registered lower percentages of correct responses on

the pre-test). Thus, responses to this item suggest that students' critical thinking skills, at least as regards a specific claim about one alleged paranormal phenomenon, improved as a result of reading the novel.

Figure 4 shows the percent correct (i.e., those who strongly disagree) for the statement, "There is scientific proof that astrology can be accurate." This item, which also dealt with critical thinking skills, yielded results similar to the results from item three. Improvement in the percent of students who "strongly disagree" occurred for both psychology and behaviorology students, and this was true for both semesters.

Discussion

The data show that *The Millennium Man*, a novel for ages 14 and up, is a useful tool for improving students' appreciation for science and technology, and for enhancing their critical thinking skills. And students enjoyed the novel, based on their informal comments.

Additionally, the novel would seem to be a useful tool with which to teach behaviorology/behavior analysis. As one reviewer put it, "The book is easy to follow and would have interesting potential as a supplement in a general psychology class, or an introductory class on behavior modification and analysis..." (Hummel, 1998).

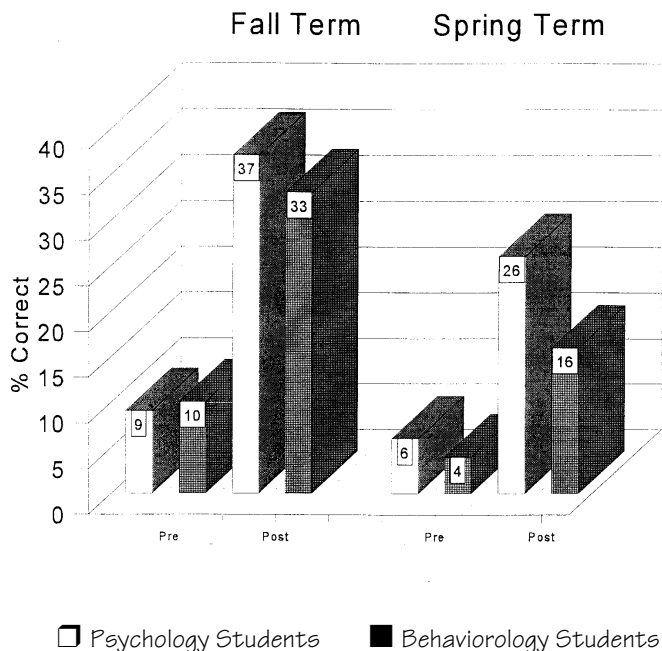


Figure 3: Those who disagree strongly with the statement, "There is scientific proof that some people have the gift of extra sensory perception."

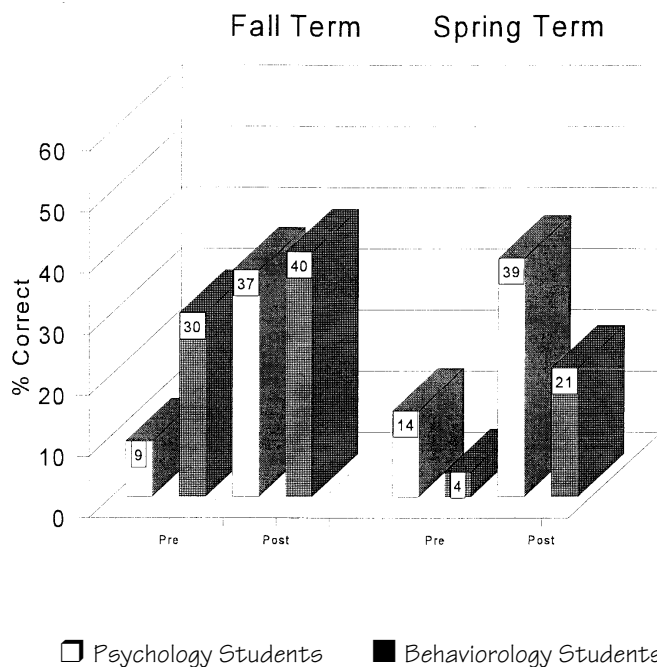


Figure 4: Those who disagree strongly with the statement, "There is scientific proof that astrology can be accurate."

Another reviewer said, "The novel, *The Millennium Man*, by W. Joseph Wyatt lives up to its honest billing as a 'positive look at behavior analysis'..." (Ledoux, 1998).

Endnote

These data were part of a larger presentation with Stephen F. Ledoux as coauthor that was presented under the title "Methods for pedagogical success with *The Millennium Man*," at the twenty-sixth convention of the Association for Behavior Analysis, Washington, DC, 26-30 May 2000 (see Ledoux, 2000).

References

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