Gottesman and Hoskins
Supplemental information on SAAB survey statements

The "decoding primary literature", "interpreting data", "active reading", "visualization" , "thinking like a scientist" and "research in context" categories were derived by factor analysis, and epistemological categories defined with reference to the literature on student beliefs about the nature of knowledge, as described in Hoskins et al, 2011 (CBE LSE 10 (4) 368-378). Some statements were phrased negatively on the survey and reverse-scored for analysis. These are indicated with (R).

Decoding Primary Literature

The scientific literature is difficult to understand. (R)

I am confident that I could read a scientific paper and then explain it to another person.

I am confident in my ability to critically review scientific literature.

When I see scientific journal articles it looks like a language I don't understand. (R)

I am intimidated by the scientific language in journal articles. (R)

I am comfortable defending my ideas about experiments.

Interpreting Data

It is easy for me to transform data, like converting numbers from a table to percents.

It is easy for me to relate the results of a single experiment to "the big picture."

If I see data in a table, it is easy for me to understand what it means.

If I am shown data (graphs, tables, charts), I am confident that I can figure out what the data mean.

Active Reading

I could make a simple diagram that provides an overview of an entire experiment.

The way you display your data can affect whether or not people believe it.

If I am assigned to read a scientific paper, I typically look at the methods section to understand how the data were collected.

I know how to design a good experiment.

Visualization

When I read scientific material it is easy for me to visualize the experiments that were done.

When I read scientific information, I usually look carefully at the associated figures and tables.

If I look at data presented in a paper, I can visualize the method that produced the data.

When I read a paper I have a clear sense of what physically went on in a lab to produce the results and information I am reading.

Thinking Like A Scientist

I enjoy thinking up additional experiments when I read scientific papers.

I accept the information about science presented in newspaper articles without challenging it. (R)

After I read a scientific paper, I think I could explain it to somebody else.

Research in Context

Progress in curing many diseases has been made as a result of experiments on lower organisms like worms and flies.

I understand why experiments have controls.

Experiments in "model organisms" like the fruit fly have led to important advances in understanding human biology.

Knowledge is Certain

Results that do not fit into the established theory are probably wrong. (R)

Because scientific papers have been critically reviewed before being published, it is unlikely that there will be flaws in scientific papers. (R)

The data from a scientific experiment can only be interpreted in one way. (R)

If two different groups of scientists study the same questions, they will come to similar conclusions. (R)

Sometimes published papers must be reinterpreted when new data emerge years later.

Because all scientific papers are reviewed by other scientists before they are published, the information in the papers must be true. (R)

Innate Ability

You must have a special talent in order to do scientific research. (R)

I think professionals carrying out scientific research were probably straight "A" students as undergrads. (R)

Science is Creative

Science is a creative activity.

Sense of Scientists

I have a good sense of what research scientists are like as people

Sense of Motives

I have a good sense of what motivates people to go into research.

Known Outcomes

Scientists usually know what the outcome of their experiments will be. (R)

Collaboration

Collaboration is an important aspect of scientific experimentation.