Source of the Data The data in Table 1-1 were provided by M. J. Tramo, W. C. Loftus, T. A. Stukel, J. B. Weaver, and M. S. Gazziniga, who discuss the data in the article "Brain Size, Head Size, and IQ in Monozygotic Twins," *Neurology*, Vol. 50. The researchers are from reputable medical schools and hospitals, and they would not gain by putting spin on the results. In contrast, Kiwi Brands, a maker of shoe polish, commissioned a study that resulted in this statement, which was printed in some newspapers: "According to a nationwide survey of 250 hiring professionals, scuffed shoes was the most common reason for a male job seeker's failure to make a good first impression." We should be very wary of such a survey in which the sponsor can somehow profit from the results. When physicians who conduct clinical experiments on the efficacy of drugs receive funding from drug companies they have an incentive to obtain favorable results. Some professional journals, such as the *Journal of the American Medical Association*, now require that physicians report such funding in journal articles. We should be skeptical of studies from sources that may be biased.

Sampling Method The data in Table 1-1 were obtained from subjects who were recruited by researchers, and the subjects were paid for their participation. All subjects were between 24 years and 43 years of age, they all had at least a high school education, and the medical histories of subjects were reviewed in an effort to ensure that no subjects had neurologic or psychiatric disease. In this case, the sampling method appears to be sound.

Sampling methods and the use of randomization will be discussed in Section 1-4, but for now, we simply emphasize that a sound sampling method is absolutely essential for good results in a statistical study. It is generally a bad practice to use voluntary response (or self-selected) samples, even though their use is common.

DEFINITION A **voluntary response sample** (or **self-selected sample**) is one in which the respondents themselves decide whether to be included.

The following types of polls are common examples of voluntary response samples. By their very nature, all are seriously flawed because we should not make conclusions about a population on the basis of such a biased sample:

- Internet polls, in which people online can decide whether to respond
- Mail-in polls, in which subjects can decide whether to reply
- Telephone call-in polls, in which newspaper, radio, or television announcements ask that you voluntarily call a special number to register your opinion

With such voluntary response samples, we can draw valid conclusions only about the specific group of people who chose to participate; nevertheless, such samples are often incorrectly used to assert or imply conclusions about a larger population. From a statistical viewpoint, such a sample is fundamentally flawed and should not be used for making general statements about a larger population. The Chapter Problem involves an America OnLine poll with a voluntary response sample. See also Examples 1 and 2, which follow.

Value of a Statistical Life

The *value of a statistical life* (VSL) is a measure routinely calculated and used for making decisions in fields such as medicine, insurance, environmental health, and transportation safety. As of this writing, the value of a statistical life is $6.9 million.

Many people oppose the concept of putting a value on a human life, but the word *statistical* in the "value of a statistical life" is used to ensure that we don't equate it with the true worth of a human life. Some people legitimately argue that every life is priceless, but others argue that there are conditions in which it is impossible or impractical to save every life, so a value must be somehow assigned to a human life in order that sound and rational decisions can be made. Not far from the author's home, a parkway was modified at a cost of about $3 million to improve safety at a location where car occupants had previously died in traffic crashes. In the cost-benefit analysis that led to this improvement in safety, the value of a statistical life was surely considered.