Assignment 1

17–12. For example: People are often eager to assume that short-run success will continue indefinitely (gamblers are reluctant to quit after winning, people justify risky behavior because it has not killed them yet, etc.). Additionally, people tend to believe that tragedies happen to others.

Assignment 2

20–11. (a) \((0)(0.2)+(1)(0.3)+(2)(0.5) = 1.3\) female offspring. (b) When a large population of beetles is considered, each generation of Asian stochastic beetles will contain close to 1.3 times as many females as the preceding generation. So the population will grow steadily. If the expected number of female offspring were less than 1—say 0.80—each generation would contain only about 80% as many females as the preceding generation.

20–12. The psychic makes an average profit of 
\((10)(0.51) + (0)(0.49) = \$5.10\) per customer (ignoring any postage costs).

<table>
<thead>
<tr>
<th>Sex of child</th>
<th>Probability</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boy</td>
<td>0.51</td>
<td>$10</td>
</tr>
<tr>
<td>Girl</td>
<td>0.49</td>
<td>$0</td>
</tr>
</tbody>
</table>

Assignment 3

Chapter 3 Solutions

3–1. 4.5% is a statistic (related to the sample of 50,000 households).

3–2. 2.503 cm is a parameter (related to the population, i.e., the whole lot); 2.515 cm is a statistic (related to the sample of 100 ball bearings).

3–3. 43 is a statistic (related to the sample of 100 phone numbers); 52% is a parameter (related to the population of all LA phone numbers).

3–4. 68% is a parameter (related to the population of all registered voters in Indianapolis); 73% is a statistic (related to the sample of registered voters among those called).

3–20. The margin of error (for 95% confidence) is roughly \(\frac{1}{\sqrt{301}} = 0.045\) – quite similar to the 5% margin of error given by Gallup.

3–22. The margin of error is roughly \(\frac{1}{\sqrt{61,239}} = 0.004\), or about ±0.4%.

4–2. (a) Nonsampling error: a response error. (b) Nonsampling error: a processing error. (c) Sampling error: a voluntary response sample.
4–19. (a) Assign labels 0001, ..., 2000 for men and 001, ..., 500 for women then use the table twice. We want to choose two separate SRSs: one from the women and one from the men. Starting at line 122, we choose these women:

138, 159, 052, 087, 359

and then (continuing on from where we ended up) these men:

1369, 0815, 0727, 1025, 1868.

If we pick men first, then women, we choose

1387, 0529, 0908, 1369, 0815

and


See note on page 249 about using Table A. (b) Each male has a 200/2000 = 0.1 chance of being polled. Each female has a 200/500 = 0.4 chance of being polled.

Assignment 4

5–3. It is not clear that the breastfeeding mothers' warm attitudes are caused by the fact that they nursed their babies. Their prior attitudes toward their babies—which probably influenced their choice of feeding method—is the lurking variable; the effect of the prior attitude is confounded with the effect of the nursing.

For 5–3.

Breast or bottle feed?  
\[ \text{Attitude toward baby} \]
\[ \text{Prior attitude toward baby} \]

For 5–4.

\[ \text{Job training program} \]
\[ \text{Unemployment rate} \]
(Other variable)

5–5. (a) The subjects are the physicians, the explanatory variable is medication (aspirin or placebo), and the response variable is health, specifically whether the subjects have heart attacks. (b) Below.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Treatment 1</th>
<th>Group 2</th>
<th>Treatment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,000 physicians</td>
<td>Aspirin</td>
<td>11,000 physicians</td>
<td>Placebo</td>
</tr>
</tbody>
</table>

Observe heart attacks

5–22. In the first design—an observational study—the men who exercise (and those who choose not to) may have other characteristics (lurking variables) which might affect their risk of having a heart attack. Since treatments are assigned to the subjects in the second design, the randomization should “wash out” these factors.