

## Effects of Progressive and Sex-Object Images of Women in Advertisements'

### Mean and Standard Deviation

**Statistical Guide:** See the previous exercise to review the mean and standard deviation. In that exercise, you analyzed data from a population and used the basic formula for the standard deviation. When estimating the standard deviation for a population from a sample, we use a modified version of the formula (called either the population estimate, best estimate, or unbiased estimate formula).

**Background Notes:** Researchers were interested in the effects of advertisements on sex-role stereotyping. They asked a sample of college students to rate full-page color advertisements from mass circulation magazines for a variety of characteristics such as use of color, layout, etc., to maximize their attention to the ads and to distract them from the true purpose of the experiment. Some of the students rated ten sex-object ads (erotic depictions of women); some rated ten progressive ads (women being competent in non-traditional roles); others rated control ads (product-oriented with no human figures). Then all subjects took Burt's Sexual Attitude Survey, which, among other things, measures sex-role stereotyping with nine items that subjects rate on a seven-point scale from strongly agree to strongly disagree. (Sample item: "There is something wrong with a woman who does not want to marry and raise a family"). In this exercise, you will be analyzing the scores for the male subjects in the study.

**Making Predictions:** Before examining the data below, predict the results you will obtain. (When scientists make predictions, they are hypothesizing.) Note that your predictions are not right or wrong. Rather, they represent your best guess as to the outcomes you will obtain. After you perform the calculations, you will be able to determine whether the data support your predictions.

1. Predict whether the advertisements affected the sex-role stereotyping scores of the male students.
  - A. Yes, it had an effect.
  - B. No, it did not have an effect.
2. If "yes" to question 1, predict which group had the highest mean sex-role stereotyping score.
  - A. Those who rated the sex-object advertisements.
  - B. Those who rated the progressive advertisements.
  - C. Those who rated the control advertisements.
3. Predict which group of male students had more variability in their scores.
  - A. Those who rated the sex-object advertisements.
  - B. Those who rated the progressive advertisements.
  - C. Those who rated the control advertisements.

Data: The scores of the males (where higher scores indicate more sex-role stereotyping) are shown in these tables:

| <u>Sex-object advertisements</u> | <u>Progressive advertisements</u> | <u>Control advertisements</u> |
|----------------------------------|-----------------------------------|-------------------------------|
| 13                               | 24                                | 23                            |
| 30                               | 22                                | 17                            |
| 24                               | 31                                | 17                            |
| 30                               | 40                                | 14                            |
| 27                               | 32                                | 21                            |
| 34                               | 21                                | 33                            |
| 28                               | 33                                | 34                            |
| 42                               | 37                                | 24                            |
| 38                               | 17                                | 9                             |
| 25                               | 39                                | 12                            |
| 29                               | 21                                | 24                            |
| 38                               | 25                                | 26                            |
| 16                               | 41                                | 14                            |
| 32                               | 14                                | 22                            |
| 41                               | 20                                | 29                            |

Calculations:

4. Calculate the means and standard deviations to two decimal places. For the standard deviation, use the formula appropriate for estimating the population standard deviation from a sample. Enter the values in Table 1.

You will need to calculate the sum of scores and sum of squared scores for those who viewed the sex-object advertisements in order to complete this exercise. For the convenience of those of you who are using calculators instead of computers, the sum of scores and the sum of squared scores for the other two groups are given here:

For progressive advertisements:  $\sum X = 383$  and  $\sum X^2 = 10,995$

For the control advertisements:  $\sum X = 349$  and  $\sum X^2 = 9,113$

Table 1 *Means and standard deviations of sex-role stereotype scores under three conditions*

|                                     | <i>m</i> | <i>s</i> |
|-------------------------------------|----------|----------|
| Sex-object advertisements (n = 15)  |          |          |
| Progressive advertisements (n = 15) |          |          |
| Control advertisements (n = 15)     |          |          |

Checking Your Predictions:

5. Based on the means, were your predictions in questions 1 and 2 confirmed? Explain.
6. Based on the standard deviations, was your prediction in question 3 confirmed? Explain.

Question for Discussion:

7. In your opinion, would it be worthwhile to replicate this study with larger, more demographically diverse samples? Explain.

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<sup>1</sup>Data source: Katherine Covell, University College of Cape Breton, Nova Scotia, Canada. For more information on this topic, see Lanis, K., & Covell, K. (1995). Images of women in advertisements: Effects on attitudes related to sexual aggression. *Sex Roles*, 32, 639-649.