

36. Impact—Effect Sizes



Impact large or small?

An interpretive context

Magnitude explained

Do you remember the question about how large a sample might be needed to determine whether a professional fighter could break a person's nose with a single punch from the chapter on sampling and sample sizes? The central issue there was the *effect size*, which is considerable. The difference in the original configuration of a person's nose before being hit by a professional fighter is expected to be considerably altered through the impact with the fighter's fist or other body part.

Yet, most effect sizes are not as large as that extreme example. Many are subtle and require far larger samples to uncover. How much skin damage should be expected after using an adhesive bandage for a single day? For some sensitive people, the answer is quite a bit of expected damage. Yet many more people would be needed to estimate the risk for a randomly selected individual than for the professional fighter example. As another example of job security: The values (i.e., parameters) and equations needed to estimate effect sizes most often require the assistance of a statistician with subject-matter expertise. The bottom line is being able to describe the size of an impact or difference.

The high school principal knows that items with large effect sizes tend to raise eyebrows, get headlines, and result in publicity that can sometimes be orchestrated, as opposed to simply happening. He looks for the game-winning 50-yard field goal and the students with perfect national test scores and those who gained admission to Ivy League colleges. While reducing waste in the cafeteria might be critical to employing additional staff or purchasing other supplies, last year's 3.7% reduction wouldn't make headlines that could help the school in other ways. Nonetheless, the \$24,000 saved more than made up for the statewide reductions in library and music funding.

The director of public health just finished dealing with an outbreak of influenza. The effect size (in this case, how quickly are how many people being infected and in how large an area) would place it just shy of being characterized as an epidemic, according to prevailing criteria. This is a huge relief. The department had risked overspending its budget on a flu immunization campaign. A contained outbreak would be far easier to defend and obtain funding for next year than an epidemic that occurred after all those resources had been deployed.

