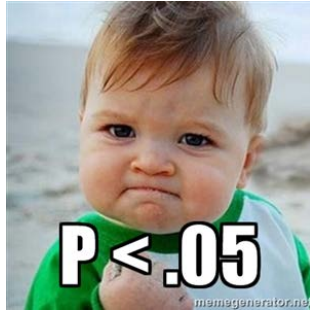

Understanding Statistics • Next Steps in TPRS Research

A handout for readers of research, graduate students, and teacher researchers



Why do you need statistics? Suppose you feel that your classes do better when taught with TPRS as compared to the way you used to teach. Statistics tell you if students' scores on a given assessment are actually better than the scores of a comparison group (the same students at an earlier timepoint, or a different set of students), or if they just appear to be better.

The goal is $p < .05$ The letter p is the probability that the groups you are comparing are actually the same. $.05$ is 5%. So if a study reports that $p < .05$, there is a 95% chance that the groups are really different from each other, and only a 5% chance that the groups are actually the same and the

results were in error. If you get $p < .05$, you can state that your results are **significant**.

t-tests and ANOVAs These are two ways to compare groups of students. T-tests can only compare two groups, but ANOVAs can compare three or more groups. ANOVA stands for ANalysis Of VAriance. For both tests, you start with a spreadsheet of students and their scores on some assessment. You get a number called t or F , which the computer program uses to calculate the p .

Correlation If things are correlated, then when one gets bigger, the other gets bigger or smaller. For instance, poverty is correlated with poor performance in school. The abbreviation for correlation is r . If $r = 0$, then the things are really not correlated (like birth date and success in foreign language). If $r = 1$, then the things are perfectly correlated (like height in centimeters and height in inches).

Effect sizes Suppose that TPRS students do better, but the advantage is only 1 point on every test—not a very impressive effect. Effect sizes are described as small, medium, and large. $r = 0.1$ is small, $r = 0.3$ is medium, and $r = 0.5$ is large. The advantage of TPRS over traditional teaching has been measured as a medium (Varguez, 2009) to large (Watson, 2009) effect size.

Next Steps

Replication

Use a tried-and-true research design such as Watson (2009), Varguez (2009), Oliver (2012), or Dziedzic (2012) to confirm that previous results in favor of TPRS are reliable (can be found again by different researchers with different participants). Replication is the cornerstone of science!

Enrollment

Many teachers have documented that greater numbers of TPRS students continue to upper levels, but no one has published this. You be the first.

New groups

We need more information about elementary and college TPRS students, and about languages other than Spanish.

Retention

TPRS should have advantages in retention over time, in comparison to traditional teaching. Compare TPRS students and traditional students on the same measure right before their summer break and right after their summer break.

