

## USING PSYCHOLOGICAL TESTING TO MAKE STATISTICS UNDERSTANDABLE AND MEANINGFUL: AN EXPLORATORY STUDY

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**BACKGROUND:** The use of real data in teaching statistics has been increasingly recommended in statistics education (e.g., Hall, 2011) and, in particular, the need to use data that are of particular interest for students to motivate and engage them in learning (Neumann, Hood & Neumann, 2013). Starting from these assumptions, psychological testing may offer an opportunity to work on real data (i.e., test scores) to teach statistics to psychology students. Indeed, testing relies heavily upon statistical notions that are necessary for transforming and interpreting norm-referenced test scores. In line with previous studies that used students' scores in high stakes tests to support in-service and pre-service mathematics teachers' in learning statistics (Confrey & Makar, 2005; Confrey, Makar, & Kazak, 2004), we explored the possibility to improve psychology students' statistics learning proposing them to conduct data investigations into their own psychological test scores.

**METHOD:** A voluntary lab activity was presented to a sample of psychology students (N=368; age: M = 20.82, SD = 1.70; 76.4% females) attending a psychometrics course. Each student was asked to fill a test measuring six personality traits and to compute the scores. Then, a dataset was created recording all the students' scores and it was used to define the test normative parameters (frequency distributions, means, and standard deviations) of the psychology student population at the University of Florence. Successively, each student was asked to transform her/his scores in z-scores using these parameters, and to interpret them. Then they were asked to produce a brief report on their obtained profile.

**FINDINGS:** About 65% of the students attended the lab activity. Among them, 74% passed the exam at the first attempt, 21% failed, and 5% delayed the exam; among students who did not participate, only 38% passed the exam at the first attempt, 25% failed, and 37% delayed the exam [ $\chi^2(2) = 71.55, p < .001$ ]. This result suggests that using real data derived from psychological testing may increase the exam performance, but also help students in avoiding procrastination. As a tentative explanation, conducting data investigations into their own scores seems to make clearer the meaning of some statistical concepts and, at the same time, motivation and engagement are improved showing one of the possible uses of statistics in the psychologist's professional practice.

**CONCLUSIONS:** These findings provide some evidence that statistics should be taught showing *how* a psychologist can use statistics and *why* she/he needs to use it. This very preliminary study offers an example of using real data to make statistics understandable and meaningful, and, at the same time, to highlight its real (professional) relevance.

### References:

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