

MIDDLE SCHOOL STUDENTS' EMERGING DEFINITIONS OF VARIABILITY³

Matthew Ciancecetta, J. Michael Shaughnessy, and Daniel Canada
Portland State University

As part of a multi-year research project to investigate the development of secondary and middle school students' conceptions of variability¹ we collected survey data from 84 students in two 6th grade classes and one 7th grade class in a large metropolitan area in the United States. In this poster presentation we report results from student responses to questions used by Watson, et al. (in press) in their study of the understandings of statistical variation of students in Tasmania, Australia. The questions are: "What does 'variation' mean?", "Use the word 'variation' in a sentence." and "Give an example of something that 'varies'."

The analysis by Watson, et al. (in press) focused on categorizing responses into a hierarchy where responses increase in structure and understanding. We focus our analysis on meaning. Student responses were initially categorized according to definitions of variation found in The Oxford Dictionary of Current English (2001) then refined as follows:

- **Slight difference (SD)** – a change or slight difference in condition, amount or level
 - **M** – student refers to measurement, data or samples
 - **A** – student refers to appearance, characteristics or condition
 - **P** – student refers to processes or actions
- **Distinct form (DF)** – a different or distinct form or version
- **Unclear** – student response is unclear, unreadable, or makes no sense
- **Omit** – no response from student

The results, which will be displayed graphically on the poster along with examples of student responses, show that of the 7th grade responses 58.6% related to SD, 10.3% related to DF and 31% were unclear/omitted and of the 6th grade responses 20% related to SD, 9.1% related to DF and 70.9% were unclear/omitted. As expected, no students referred to spread or range. These preliminary results begin to inform about the meanings of 'variability' held by these students, which in turn adds to our knowledge about the teaching of probability and statistics.

References

- Watson, J., Kelly, B., Callingham, R., & Shaughnessy, J. M. (in press). The measurement of school students' understanding of statistical variation. *The International Journal of Mathematical Education in Science and Technology*.
- Soanes, C. (Ed.). (2001). *The Oxford dictionary of current English* (3rd ed.). Oxford: Oxford University Press.

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