1067-T1-159   **James R. Henderson*** (`henderso@pitt.edu`), 504 E. Main Street, Titusville, PA 16354.
Causation and Explanation in Mathematics.

One of the trickier issues in teaching a statistics course is making clear the causation/correlation distinction. Consider: (1) There is 100% correlation between mammals and animals having three bones in the middle ear. This all-and-only parallel seems to be a completely accidental evolutionary happenstance. (2) There is a very strong positive correlation between the shoe size and reading-comprehension scores of children. Here shoe size and reading scores are the twin effects of the common cause of aging. (3) Any free hydrogen atom is capable of bonding with any free fluoride atom. This stems directly from the atomic structures of hydrogen and fluoride. The subject of causality may seem far removed from the objects of mathematics, but Bernard Bolzano formulated a theory of cause and effect for (among other things) mathematical propositions in his 1837 Theory of Science. I will consider what Bolzano has to say about causality in mathematics and see what implications there are for the related subject of mathematical explanations. (Received July 28, 2010)