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Identifying Student Difficulties with Control of Variables Reasoning ANDREW BOUDREAUX, Western Washington University — Emerging standards for the science learning of precollege students can be regarded as a statement of what constitutes science literacy.[1] These standards emphasize basic concepts such as mass, volume and density, and fundamental process skills such as proportional reasoning, the interpretation of graphs and other representations, and the control of variables in the design of experiments. At Western Washington University, the liberal arts physics course is a general university requirement and for many students one of the only physical science course taken between high school and college graduation. Thus the pre-course understandings of these students can be taken as a measure of the level of science literacy attained in precollege education. An effort is underway at Western Washington University to examine what students know and are able to do both before and after course instruction. Preliminary results indicate that in many cases students have serious conceptual and reasoning difficulties with the material. An example that involves the interpretation of experimental results in deciding whether a particular variable influences (*i.e.*,affects) or determines (*i.e.*,predicts) a given result will be discussed. Evidence from written questions will be presented to identify specific student difficulties.[1]See, for example, Project 2061, American Association for the Advancement of Science. 1990. *Science for All Americans.*New York, NY: Oxford University Press.

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