The Development of Reasoning Skills in College Biology:  
Do Two Levels of General Hypothesis-Testing Skills Exist?


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Abstract: The primary purpose of the present study was to test the hypothesis that two general developmentally based levels of hypothesis-testing skills exist. The first hypothesized level presumably involves skills associated with testing hypotheses about observable causal agents; the second presumably involves skills associated with testing hypotheses involving unobservable entities. To test this hypothesis, a hypothesis-testing skills test was developed and administered to a large sample of college students both at the start and at the end of a biology course in which several hypotheses at each level were generated and tested. The predicted positive relationship between level of hypothesis-testing skill and performance on a transfer problem involving the test of a hypothesis involving unobservable entities was found. The predicted positive relationship between level of hypothesis-testing skill and course performance was also found. Both theoretical and practical implications of the findings are discussed. © 2000 John Wiley & Sons, Inc. J Res Sci Teach 37: 81-101, 2000