The Nature and Development of Hypothetico-Predictive Argumentation
with Implications for Science Teaching

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Abstract: This paper explicates a pattern of scientific argumentation in which scientists respond to causal questions with the generation and test of alternative hypotheses through cycles of hypothetico-predictive argumentation. Hypothetico-predictive arguments are employed to test causal claims that exist on at least two levels (designated stage 4 in which the causal claims are perceptible, and stage 5 in which the causal claims are imperceptible). Origins of the ability to construct and comprehend hypothetico-predictive arguments at the highest level can be traced to pre-verbal reasoning of the sensory-motor child and the gradual internalization of verbally mediated arguments involving nominal, categorical, causal and, finally, theoretical propositions. Presumably, the ability to construct and comprehend hypothetico-predictive arguments (an aspect of procedural knowledge) is necessary for the construction of conceptual knowledge (an aspect of declarative knowledge) because such arguments are used during concept construction and conceptual change. Science instruction that focuses on the generation and debate of hypothetico-predictive arguments should improve students' conceptual understanding and their argumentative/reasoning skills. [ABSTRACT FROM AUTHOR] (AN 11842205)