Assessing Changes in Explanations of Natural Phenomena after Exposure to Science: The Phen-Ex Task

Stella Vosniadou
University of Athens, Greece & Flinders University, South Australia

Despina Lepenioti
University of Athens, Athens, Greece

Anna Chountala
University of Athens, Greece

Kalliopi Eikospentaki
University of Athens, Greece

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Abstract: A computerized phenomena explanation task designed with E-prime was used to investigate changes in explanations about natural phenomena happening after exposure to science instruction. One hundred and four (104) elementary school children and 43 college undergraduates verified 4 different explanations for each of 60 different phenomena belonging to 3 subject matter areas: physics, biology and mathematics. Two of the 4 explanations for each phenomenon were consistent with both an initial and a scientific explanation while the remaining 2 were inconsistent with either an initial or a scientific explanation. It was hypothesized that the participants will be more accurate and faster to verify the explanations in the consistent condition compared to the inconsistent condition. The results confirmed the hypotheses across the 3 subject matter areas, indicating that initial explanations remain entrenched and inhibit access to scientific explanations even in adults. The results are also consistent with dual process theories.