

# Prediction-making in Novel Situations and the Role of Self-Generated Analogies

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**Abstract.** In this paper, we report on a cross-age in which students were asked to make predictions in situations they had not considered before (novel situations) and explain the reasons that led them to their predictions. The aim was to investigate students' predictions in these novel situations in terms of compatibility with the scientific account and the role that self-generated analogies play in their reasoning. A mixed method approach was used with data being collected through the use of written questionnaires and audio-recorded group interviews. The study sample was composed of 37, 31, 29, 35 and 34 students aged 8-9, 10-11, 11-12, 12-13 and 16-17 years respectively recruited from ten different schools in the same geographical region of Greece. A series of semi-structured group interviews/discussions were carried out in combination with the administration of a paper-and-pencil survey. Data were collected through the students' written responses in the questionnaire and those they gave during the group discussions which were tape-recorded and transcribed. These were analyzed to ascertain how they made their predictions, whether they drew on the use of analogies, and if so, the nature of the analogies that they used. The analysis revealed similarities not only in terms of the predictions students across the five age groups made, but also as per the reasoning process followed and the analogies they drew on in order to familiarize themselves with the novel situations and thus make their predictions. The use of such analogies was unrelated to their age and, in many cases, students' analogical reasoning led them to make predictions that were not compatible with the scientific view while. The findings of the study suggest that teachers need to be more aware of the nature of analogies students use in their reasoning and the incorrect ideas (misconceptions) such reasoning gives rise to. Also, more attention needs to be paid from the part of the teacher on how, and why, reasoning on the basis of such analogies can, in many cases, lead students to an understanding incompatible with the scientific account.