

Metaphors as the earth's parachute: the effectiveness of the MetaCom Green program in fostering climate hope in children

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Climate Change Communication (CCC) aims at providing insightful information about the phenomena, but also reverberates on psychological attitudes that largely determine the effectiveness of eco-sustainable messages. These attitudes, e.g., climate hope, are multifaceted and mediate the eco-sustainable actions of citizens, particularly younger ones¹. What drives the power of messages in increasing stance or reducing anti- environmental behaviours is still rather unknown. The effects of CCC are largely opaque, especially because there has been limited evaluation of the discourse and rhetorical tools adapted for communicating CC, such as metaphors. Scholars have focused primarily on the selection of these figurative devices in CC discourse to verify which metaphors trigger more urgency about the topic² or better serve as a vehicle for ensuring that complex issues are accessible to the entire population³. For instance, the widely used war metaphor has been found to be ineffective in fostering sustainable attitudes⁴, and the puzzle of selecting the right metaphor, becomes even more intricate when dealing with fragile metaphor comprehension skills. Indeed, metaphors can be misunderstood or fall short of understanding, especially in children⁵, in which metaphor comprehension skills are not fully developed⁶. As a consequence, the effectiveness of these expressions in promoting sustainability efforts and positive attitudes towards CC in developmental population is still an open issue⁷. For these reasons, we developed an intervention program on CCC manipulating the type of linguistic tool use to deliver CC-related issues (metaphorical vs. literal expressions). The metaphorical intervention (MetaCom-Green) consists of 5 sessions of interactive discussion on CC, each structured around a metaphor targeting CC issues (e.g., "The ocean is a soup") of increasing complexity, including seven tasks fostering discussion but also promoting metaphor comprehension. Sixty-eight fourth graders (Age, $M=9.42\pm 0.36$) were semi-randomly assigned to the experimental or the control group, the latter was involved in a comparable program promoting CC awareness without using metaphors. Children were assessed pre-intervention (T0) for their cognitive and linguistic profile and attitudes toward CC via scales on CC-related knowledge, hope, despair, and pro-environmental behavior at T0 and post-intervention (T1). For each variable of interest, we run mixed-effect models using Group, Time, and their interaction as predictors. At T1 the MetaCom-Green group performed significantly better than the control group in CC-related Knowledge ($p=.049$), Hope ($p=.009$), and Pro-environmental behavior ($p=.021$), also showing lower level of Despair ($p=.025$). Interestingly, children of the control group also improved in Knowledge ($p<.001$) and showed lower level of Despair ($p=.011$), yet with a limited extent compared to the MetaCom-Green group. Differently, exposure to environmental issues did not enhance the control group in terms of hope nor did it elicit greater pro-environmental behaviors. As a first consideration, our results suggest that by using age-appropriate metaphors and accompanying children in understanding them, it is possible to promote knowledge about the topics at stake as well as to change psychological and behavioral attitudes toward them. Indeed, it is possible to restore the harmony between scientific accuracy and creativity when using metaphors for complex debates, going beyond the selection of the most effective metaphor. Crucially, explicating the opaque and salient

aspects of the metaphor and guiding children during the meaning-making evoked by this powerful tool may drive them to action, while restoring their hope towards the future.

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