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Unveiling Cognitive factor dynamics: How Ordering, Prior familiarity, and Information shape public preferences for CO2 mitigation strategies

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Abstract

CO_2 reduction policies face significant hurdles due to unfavorable public opinion. This study investigates the intricate dynamics of cognitive factors, specifically, how the sequence of survey questions (ordering), prior familiarity and information provision about a new technology, Carbon Capture & Storage (CCS), shape public preferences across CO_2 mitigate strategies. Considering previous research overlooking cognitive factors and information spillover from a new energy technology to others, this study can shed light on enhancing the effectiveness of CO_2 mitigation policy initiatives.

To grasp the effects of cognitive factors on diverse approaches for mitigating CO_2 emissions such as CCS, solar panel, wind power and carbon tax etc., the national-wide survey using Denmark as the case was conducted. The questionnaire began by asking prior familiarity about a new technology, CCS, and providing three different CCS information sets given its low awareness by public. Besides, in a survey, two different orderings were tapped into for discovering the presence and dynamics of ordering impacts across various CO_2 mitigation options. The Seemingly Unrelated Regression (SUR) was employed with an effective sample, n = 3835 to gain a comprehensive understanding and assess intertwined impacts of the three factors' effects on attitudes concerning fifteen individual CO_2 mitigation approaches.

Pioneering in its exploration of the interplay of these three cognitive factors concurrently, this research uncovers paramount findings: the pronounced varied influence of ordering, the generally positive impacts of pre-existing familiarity impacts, and the heightened impact of more detailed information provision. Furthermore, the three cognitive factors mutually and significantly influence each other. These insights are instrumental in crafting more effective mitigation initiatives to gain wide public support by recognizing the paramount roles of cognitive elements in combating climate change.

Keywords: Cognitive factors, Ordering effect, Prior familiarity, Information, Low-carbon energy technologies, Carbon tax