

When Silicon Meets Consumer: A Contingency Framework for Synthetic Data Use in Marketing Research

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Abstract

The proliferation of generative AI has introduced "silicon samples"—synthetic consumer data generated by large language models—as a potential alternative to human respondents in marketing research. While offering unprecedented efficiency gains, empirical evidence reveals systematic patterns of both convergence and divergence with human responses. This paper develops a contingency framework specifying when silicon samples can substitute for, complement, or should not replace human data. Drawing on validity theory and cognitive psychology, we propose nine propositions across three dimensions: research domain characteristics, task complexity, and cognitive processing, as well as cultural-contextual specificity. The framework advances theoretical understanding of LLM capabilities and provides actionable guidance for researchers navigating the efficiency-validity tradeoff.

Track: Methods, Modelling & Marketing Analytics