# Priming Effects on Verbal Analogy Performance Across IQ Levels in Humans and AI

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**Abstract**

It is well known that verbal analogy (VA) performance correlates with IQ; we hypothesize high IQ improves VA performance due to more comprehensive relation representation, and therefore priming with congruent (incongruent) relations should especially benefit (hurt) lower-IQ individuals. We find a significant overall priming effect ($p<0.001$), IQ effect ($p<0.001$), and a quadratic IQ effect on priming ($p=0.012$): mid-IQ shows greater priming effect than high-IQ, but low-IQ participants show no effect – due to lower priming accuracy ($p<0.001$) and the positive contribution of priming accuracy to priming effect ($p=0.04$). Separately, LLMs show similar priming and IQ effects (when prompted to be low- or high-IQ), with a change in error pattern between congruent and incongruent priming just like humans, suggesting possibly similar mechanisms. Overall, these findings deepen our understanding of the role of relation representation in VA and the influence of IQ.



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