The impact of social network topology on open-ended and fixed solution problems

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Abstract

How do solution strategies spread in teams? Inspired by the 80s sci-fi movie Close encounters of the third kind, we set up a networked multiplayer game where participants had to signal peace to invading aliens from space by playing music. In each round of the game, participants were matched in dyads and through chat had to jointly construct a four-tone melody. Melodies translated to points according to a rugged landscape score system. We compared three network topologies: a lattice network (participants only play with immediate neighbours), a fully connected network, and dyads. Furthermore, we manipulated the nature of the problem being either open-ended or with fixed solutions by making the maximum possible score known or not. With known maximum score, lattice networks show an advantage with increased propensity to explore and diffusion of good solutions, compared to fully connected networks. No effects are observed when the maximum score is unknown.