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The Impact of Selectivity on Fitness Evolution in the Multi-Generational Matching Problem[1] STEPHEN DIPPLE, TAO JIA, GYORGY KORNISS, BOLESLAW SZYMANSKI, Rensselaer Polytechnic Institute — The stochastic matching hypothesis has been found to produce self-similar pairing without explicitly requiring self-similarity in the rules for matching. Here, we introduce an added complexity of selectivity in which the relative probability of being matched are modified.[2] This allows for probing in areas between the currently established matching hypothesis, random matching, and the extreme case of super selectivity, where only the very best fitness matches for nodes are created. A higher selectivity parameter has been found to indirectly increase the number of matches in the system monotonically. A fairly simple model is then implemented to produce offspring who inherit fitness based on the inherited fitness distribution which is a function of the parents' fitness. While the results show that the specific distribution used may limit the inherited quality factors to a too narrow range to be broadly applicable, the model does expose some interesting patterns in fitness evolution across multiple generations in the context of selectivity and network degree distribution.

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[2]T. Jia, R.F. Spivey, B. Szymanski, G. Korniss, PLOS ONE 10(6): e0129804 (2015)

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