

## **Monogamy is Optimal**

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What does monogamy have to do with mathematics? After all, monogamy is “marriage with but one person at a time.” So, what does mathematics have to say about such marriage arrangements? We build a mathematical model to measure the total happiness in an idealized society of adults with equal numbers of males and females. Then we proceed to optimize the total happiness. The key step is a well-known theorem due to G. Birkhoff and John von Neumann: every square, doubly stochastic matrix is a convex combination of permutation matrices.

When I teach Graph Theory, Mathematics 472, this is one of my favorite illustrations involving matchings in bipartite graphs.

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