PSC 120 Article 2 Review

The authors of "The Matching Hypothesis Reexamined" are trying to address the limitations of the agent based models that were used in previous studies to examine human interactions in simulating the dating pool. The main issue with the previous models was that they assumed agents would match with each other through random matching processes, without respect to location in physical and social space. The authors explain how this is an unrealistic assumption, as in reality, humans are constrained by their physical space and social networks. The authors explain that married couples tend to share a location of origin, and that human mating is much more complex and can be predicted by simple random interactions.

This new simulation made attempts to make the agent interactions much more "human-like". For example, one addition was changing preferences due to age or previous failed relationships. The new model accounts for humans that are more likely to accept less than ideal mates as it may outweigh the benefits of being single as they get older, or due to previous failed relationships. Another important factor to consider the physical location restrictions of the real world was that the researchers utilized a 2x2 grid to place agents, and create a small search radius in which the agents can only interact with each other. All agents were also given one of two types of random movement strategies, either Brownian or Zigzag. This allowed the simulation to model humans that may move through different neighborhoods, but tend to find partners that are close in physical space. These different methods of movement also added a mechanic similar to social mobility, as those using the ZigZag walk could move through the society much quicker than those using the Brownian walk, allowing them to go through more networks and have more opportunities to match with another agent. They also added agents that were not yet mature, and thus not ready to date, to simulate large age differences in potential relationships.

The results of the experiment were that the limited local interactions did indeed decrease the amount of matching, regardless of which matching rule was applied. An interesting finding was that the agents with restricted mobility in this new simulation had nearly identical matching when compared to using a non-spatial environment. The addition of the limited local interactions also increased the time it took to match across the board. This change was most drastic in the case of agents preferring maximally attractive partners because it was much more difficult and time-consuming for these agents to find a highly attractive partner within their respective neighborhoods, compared to older studies that utilized a single dating pool, which is a stark difference to what Kalic and Hamilton noticed. The search time also increased for the very unattractive agents, as they were no longer guaranteed to be accepted regardless of how many dates they went on. Based on this model, the researchers assumed that those that are either extremely attractive or extremely unattractive will see the greatest increases in search times as it will be much more rare to find a similarly attractive agent in their search radius. Unlike the findings of Kalic and Hamilton, when the local search radiuses are added, population density seems to play a much larger role. Kalic and Hamilton found that in non spatial environments, there were no time differences in agents who preferred maximally attractive partners. On the

other hand, the authors found that differences in population density affected the outcomes of agents using either decision rule. In my opinion, the most important modification was the addition of the local search radius. I believe that above all of the other factors, that one made the simulation drastically more realistic. Humans will always be limited in potential partners by their location, especially if we assume that humans are meeting in person and not through online methods. Although it is possible for two agents to be a perfect match, it will mean nothing if they live on opposite sides of the planet. Because of this, I believe that all humans must accept some level of opportunity cost when finding a mate, as it is incredibly rare that a human will find a perfect match for themselves in their local community, given the amount of potential partners there are in the world. I also agree with the results and believe that they reflect human society the best.

After reading this paper, I find myself agreeing with the decisions of the author to create a more realistic agent based model of matching. When reading about the first matching hypothesis, I found myself agreeing with the broader claims that were made, but felt unsure about whether or not an agent-based model could truly represent human society. However, I believe that when adding the factors such as a search radius, population density, and random mobility, it is possible to create an agent-based model that can give us insights about real human nature and interactions, which were previously impossible to measure without the use of human subjects. I believe the authors also demonstrated the importance of not fitting models to empirical data without considering the spatial and social structure of society. This paper also shows how capable agent based models can be when modeling complex social phenomena. Broadly speaking, this paper also shows how simple decision rules can simulate complex human patterns. This paper also demonstrated the importance of environmental factors when creating agent-based models. It shows that too much focus on the agents can create skewed and inaccurate results, and that the environment should also be created in a way that represents society.