

Simple Constructive Model for Short Term Rational Romantic Relationships

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Abstract

Romantic relationship initiation and first phase dynamics have been studied extensively based on observations and models, but still there has been no definite conclusion or agreement between psychologists about patterns of consistent behavior. This study will try to explain some specific behaviors related to the effect of the number of potential mates in relationship dynamics. Furthermore, manipulation skills as a way to liven up the “market” of relationships will be scrutinized. The model created is Agent Based Modelling which allows inclusion of parameters from outside, still keeping the model’s top down influence.

Hypotheses:

Significant differences between copulating options for males and females in a society create leverage to the minority to direct the relationships according to their preferences. The majority is forced to accept the conditions.

With a preference for long term stability over short flings, females in the engineering departments have more leverage in directing their relationships, showing more stability than the relationships of students from other departments where the scarcity of females is not as big.

Manipulation of one’s characteristics in showing off more than one really is, helps in environments where the number of the same sex is higher than the number of the other sex, but detracts otherwise the relationship potential.

Introduction

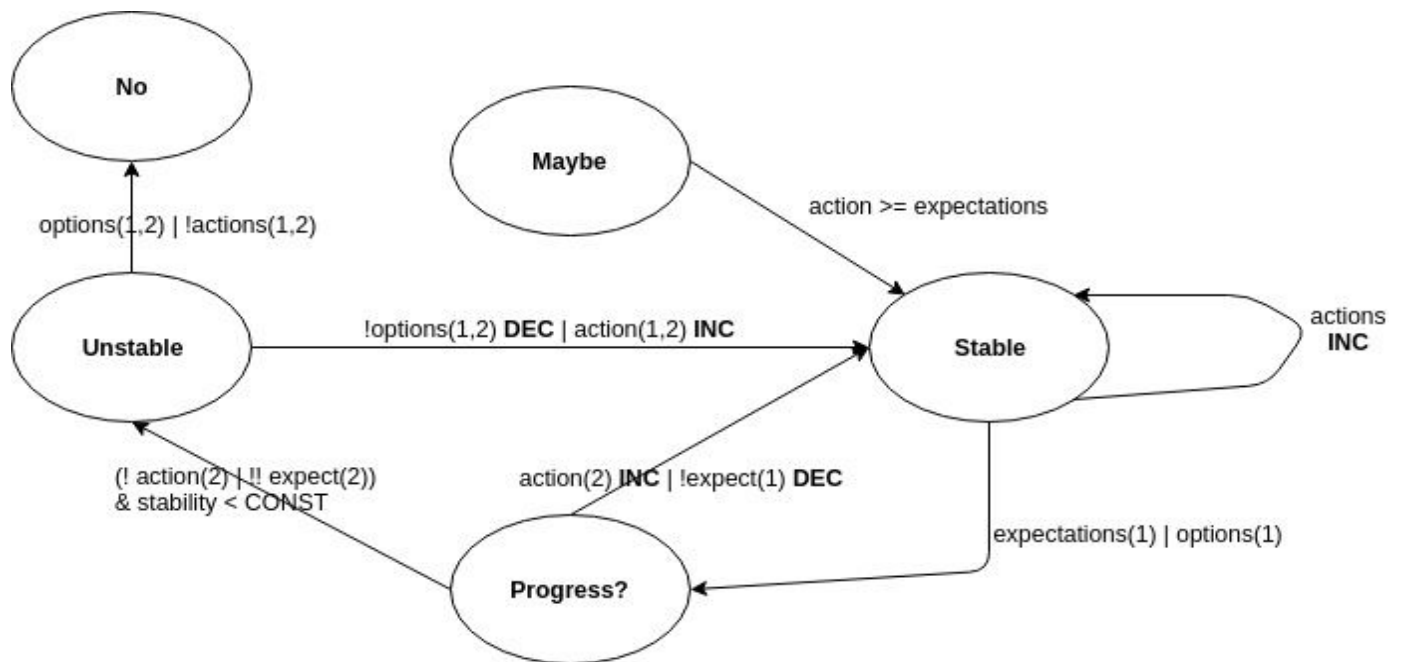
ABM: Trying to understand the human nature is a complicated task. In order to simplify this task there can either be an observational approach based on data, or a constructive approach based on theory. Experimental and observational data, analyzed statistically, tend to show different patterns of human behavior by getting the bottom up approach. Theoretical models on the other hand try to build themselves on assumptions and then show emergent properties in the human behavior, doing this way a top-down approach. Agent based modelling is one of the methods which tries to combine both of these approaches.

Romantic Relationships: Among different problems, this study deals with the romantic relationships, more specifically, short term strategy in partner choice and first phase interactions. How they are affected by two main factors: existence of other potential mates and manipulation strategy for majorities?

Framework: In order to measure the effects of these two factors, a model of romantic relationships was built, based on actions and expectations. These two factors are the ones affecting the “market” of relationships. As the agents are supposed to be rational beings, they tend to find people who fit with them most. Expectations are the perceptions of the compatibility with the potential mates’ personality and stability, which can change by time. By construction, actions are based on expectations, and cannot be misperceived and have no double meaning.

Isolated Romantic Relationships

The simplistic model based on actions and expectations was first created to understand an isolated romantic relationship and its dynamics. As mentioned above, the actions are what drive the relationship as they are the actual exchange mechanism which show what people really want. Expectations on the other hand can be the difference between what the partner has and what they want. Here is a simple representation of the isolated model.



Alphabet: action, expectations, options.

1. $\text{expect}(x) \Rightarrow$ expectations from participant x .
2. $\text{!expect}(x) \Rightarrow$ decrease of expectations from participant x .
3. $\text{!!expect}(x) \Rightarrow$ participant x against expectations.
4. $\text{!action}() (x) \Rightarrow$ repeated lack of actions from participant x .
5. $\text{action}(x) \Rightarrow$ action created from participant x .

The results of this actions or expectations affect the stability level of the relationship, as expressed by **INC** or **DEC**. There is the tendency for expectations to create more progress, or to open problems, when expectations are not fulfilled, or even not liked, from the partner.

The rational romantic relationships algorithm

1. The model starts with almost random creation of personalities for each female and male, their number defined by the user. The stability for each couple combination is 0. The created people have a desired stability level which defines how much they want a relationship.
2. The show off stage begins, where the potential mates show themselves better than they are in order to affect the potential mate. The show off effect lowers with the rounds in a relationship passing by, so the partner will eventually understand the mate's nature.
3. The option difference is measured for each of the combinations of the potential partners in order the number of people they are flirting with. If there is a big difference, this will create expectation difference and will create instability later in the relationship.
4. As the potential mates interact, there is a creation of expectations and preferences based on the perception of these mates. The expectations are affected by both partners trying to go to their desired stability level, their options' difference and their personality differences.
5. Based on expectations and other options, actions are undertaken from each couple to get closer or to get further apart from each other. These actions affect directly their stability.
6. After action taking, the participants check if there has been any relationship change, like break up, or relationship creation, which happens when stability level passes a certain limit, called relationship constant. If there is more than one relationship which passes it, choose the highest one.
7. When a relationship ends, it creates a memory for the partner, and experience for their friends. These experiences will affect the how the potential mate who broke up with their friend will be perceived in the future.

Tuning Parameters

The model is run by changing the constants that affect its methods. These tuning parameters are chosen in such a way that provide a range of variability to check different types of relationships. Here there are with their explanations (s.e = self explanatory):

- **iterations** : number of rounds the relationships will be running.
- **no_male, no_female** : number of both sexes involved.
- **factors** : characteristics of personality to be taken in account.
- **rand_factor, stable_factor**: desire for each individual to enter a relationship = $\text{stable}(x) + \text{rand}(1-x)$.
- **flirting_constant**: filters the potential partners based on random assignment, say location based..
- **decrease_factor**: decrease other potential mate's chances once in a relationship by this much.
- **ex_effect** : decrease the chances of exes as history has shown the problems.
- **lower_limit, upper_limit**: 3 stages of a relationship: before knowing well, kind of knowing somebody, and lastly understanding their intentions and personality
- **relationship_constant, consideration_constant**: considering relationships with a potential partner.
- **jump_start, normal, delusion_effect**: importance of actions in the three phases of a relationship.
- **female_friends, male_friends**: number of friends the partner's share their experiences with. Tends to be bigger in females.
- **lower_lie, upper_lie**: manipulation of certain aspects of personality for better chances.

Code Sample for Perfect matches:

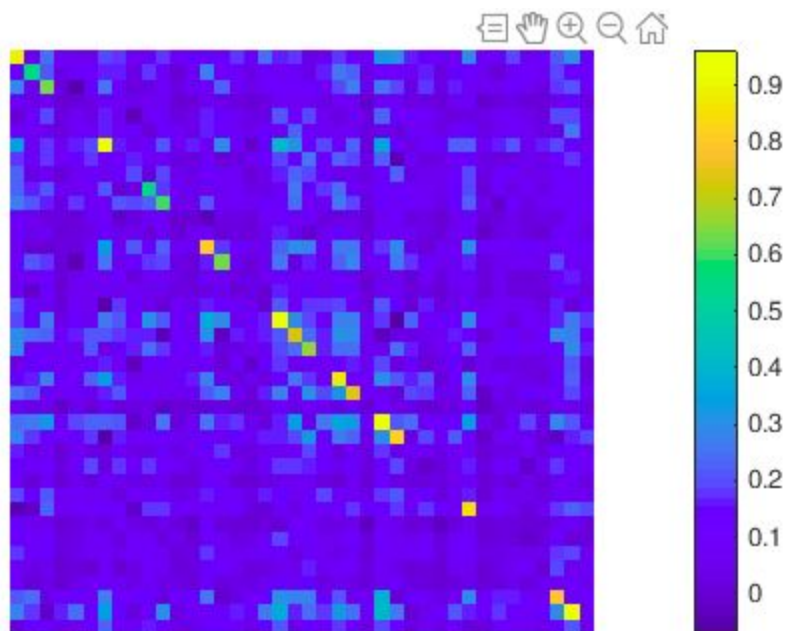
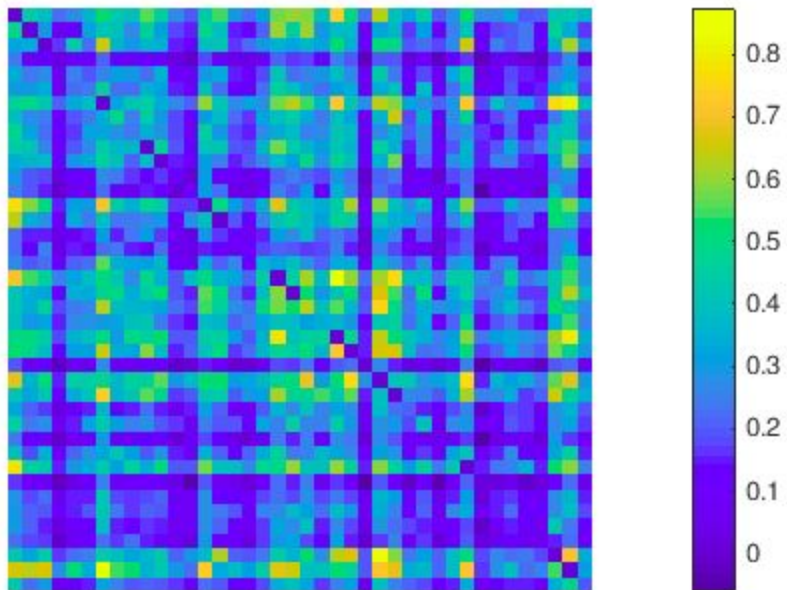
```
% In the beginning of each iteration, there is a need for the market to show more reliability than it has.
%improved_personality = perceive(personality,rounds,lower_limit, upper_limit, lower_lie, upper_lie);
%personality_diff      = sum(improved_personality,3)/factors;
personality_diff      = sum(personality,3)/factors;
% checking my options of flirting
% Filtering the people I can flirt with (assume of geographical positions)
options      = flirt2(stability,personality_diff,relationship_constant, consideration_constant);
%options      = filter .* options + ~filter .* options * ex_effect;
%stability
% creating my expectations for each combination based on personality and options
% based on expectations I act
expectations = expect( personality, stability, options, female, male, personality_diff);
actions      = act(expectations, rounds,jump_start, delusion_effect, normal, lower_limit, upper_limit);

% remember in order to track change in relationships
previous_status = status_rel;

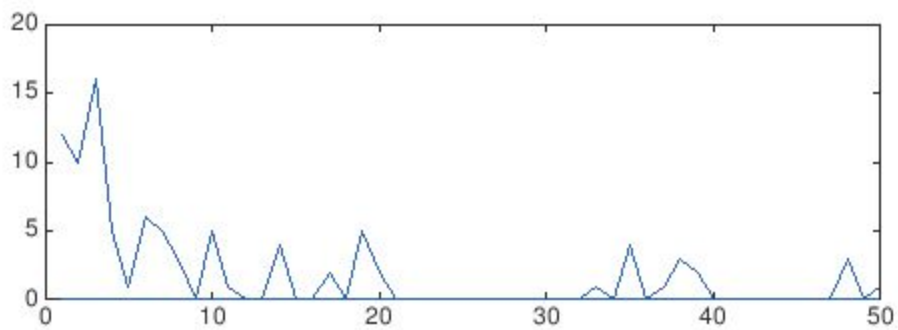
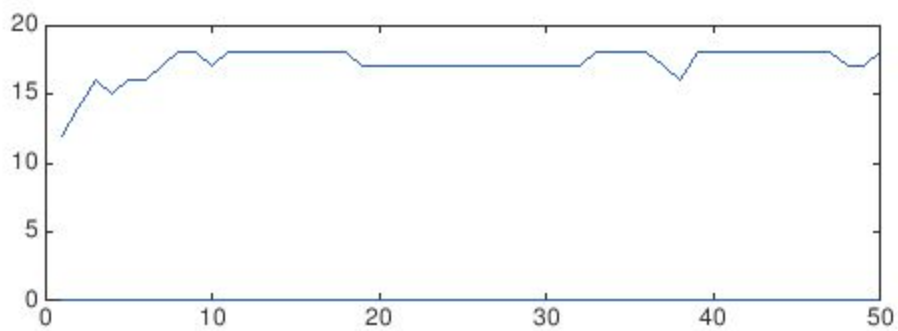
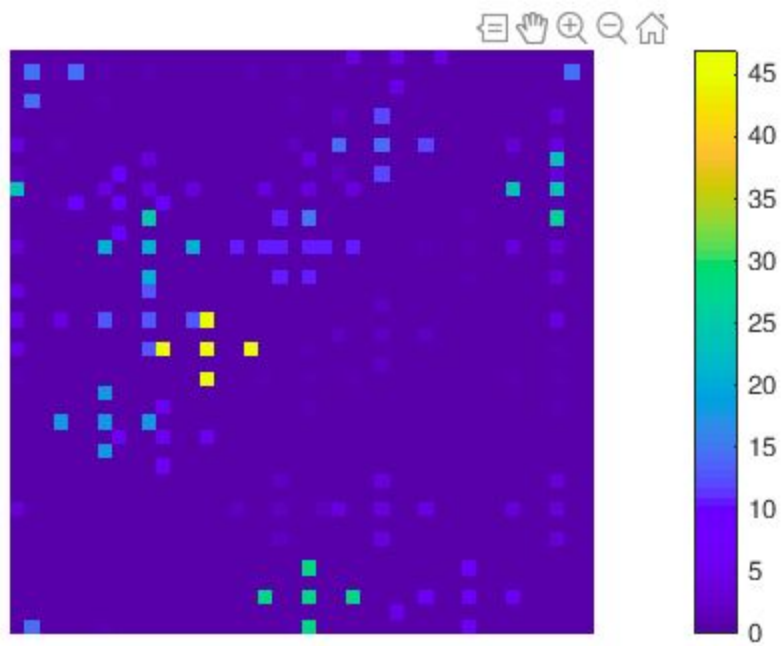
% my actions affect my stability with each possible
% I choose the best relationship and decrease the other people's chances
stability      = (stability + (rand(no_male,no_female)-doubt_constant).*(actions));%filter.*
status_rel     = stabilize(stability);
status_change  = ( previous_status - status_rel) > 0;
status_opt     = status_rel;

% check people who are not in a relationship - they are added to the status_rel
%status_opt(:,find(sum(abs(status_rel)) == 0)) =1;
%status_opt(find(sum(abs(status_rel')) == 0),:)=1;
stability      = (stability .* status_opt + (stability .* ~status_opt)/decrease_factor).*(stability<1)+(stability>1)*skip_one;
```

Expectations, Stability in the last round:



Memory, Relationships and relationship change in the last round:



Milestones

1. Development of single-relationship model.

Based on simplistic logic, the simple model related to actions and expectations was developed.

2. Decision on the type of model to be built.

Agent based modelling with a representation of relationships as agents was decided to be built as it eases the transformations and measurements in matrix form.

3. Language and Platform to be used.

Matlab was chosen as the language to be used, after trying python. It is better than python as it is based on matrices and can be faster in big dimension calculations.

4. Iteration 1

The first phase code was built by introducing concepts like create_personalities, act, expect, stabilize and run. These are the core functionalities of the simulation.

5. Iteration 2

Code was rearranged to fit a new structure where different types of people could participate, and testing was done to see the results. Types of personalities included: ambitious, humble, perfect_matches, random. New concepts were introduced like flirt, flirt2 and iterate.

6. Iteration 3

Memory, experience and manipulation were included in the code, each of them with a specific functionality. Creating a base for group knowledge was achieved.

7. Report No. 1

This report was written to keep track of what has been done.

Future Milestones

8. Full integration of functionalities - fixing bugs

The code started behaving strange when certain input is provided. There should be a complete check about the functionality and consistency of the logic. Main problem is the forming of new expectations is not happening anymore after a point.

9. Usage of realistic parameters based on student perception of romantic relationships.

After completing the code, there will be different test cases to check the connection to reality and the data patterns that this formed reality shows, in order to track trends. Inclusion of third party parameters like: economic crisis, drop in gender ratio, and different environments like engineering faculty pattern of relationships between males and females. Surveys need to be taken.