



Marriage Matching with Correlated Preferences

Onur Burak ÇELİK
Department of Economics
Yasar University
2013

Objective

- To create and measure the correlation in the preference lists then to study, via simulations, the effect of correlation on the aggregate satisfaction level of the individuals.
 - More realistic preference lists, taking into account the presence of correlation in the preferences.
 - Men-proposing Gale and Shapley (1962) algorithm
 - Marriage matching

Outline

- Introduction: Matching Theory
- Correlated Preferences: a Construction and a Universal Measure
- Marriage Matching with Correlated Preferences

College Admissions Problem

- Gale-Shapley (1962)
 - A college is considering a set of n applicants of which it can admit a quota of q .
- Uncertainties:
 - ? Has a given applicant also applied elsewhere?
 - ? How does he rank the colleges he has applied to?
 - ? Which of the other colleges will offer to admit him?
 - ? Once an offer is received, should an applicant wait for a better offer or accept it?

Matching Markets

- **NRMP**
- **High School Districts in NYC, Boston, Budapest, Singapore**
- **Kidney Exchange Program**
- **Matching advertisers with advertising slots on Google**
- **Dormitory Roommate Assignments in MIT**

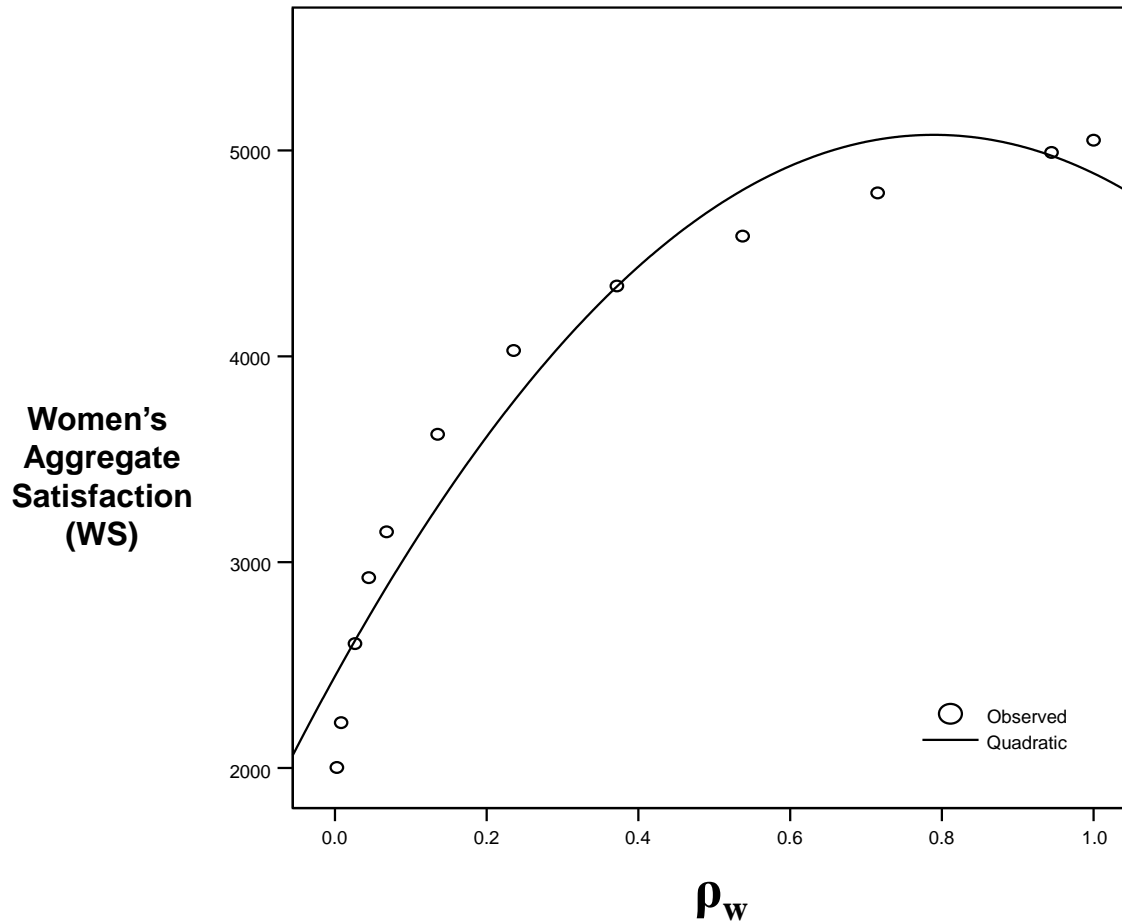
Marriage Matching with Correlated Preferences

Table 2.1. Groupings used when only men's or women's lists are correlated.

Grouping	Correlation
Random	0.00255
3,97	0.00817
10,90	0.02644
15,85	0.04458
10,10,80	0.06804
3,7,20,70	0.13535
10,10,20,60	0.23556
5,15,30,50	0.37171
10,20,30,40	0.53749
5,10,15,20,20,30	0.71528
15,15,15,15,15,15,10	0.94444
Perfect Corr.	1

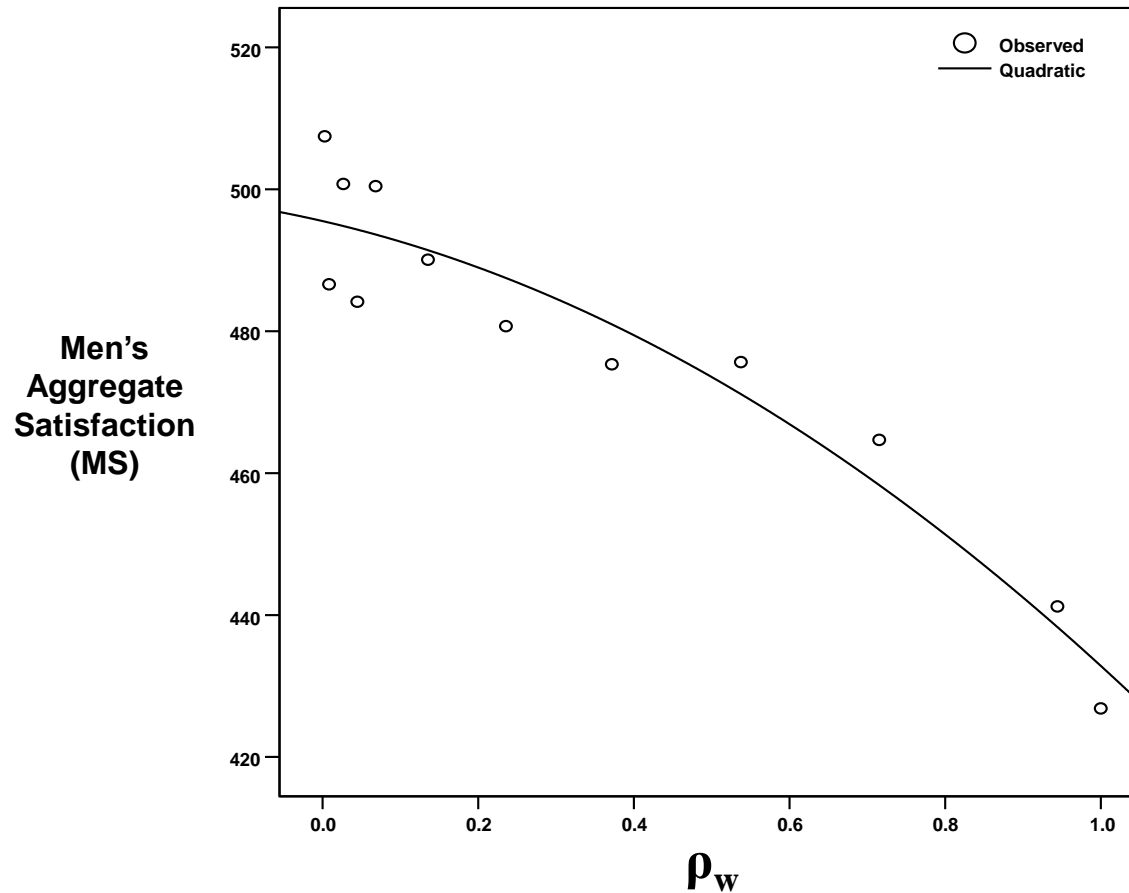
Marriage Matching with Correlated Preferences

Figure 2.1. Women's Preferences Correlated, Men's Preferences Random



Marriage Matching with Correlated Preferences

Figure 2.2. Women's Preferences Correlated, Men's Preferences Random



Marriage Matching with Correlated Preferences

Table 2.2. Regression results

	Women's Preferences Correlated	
	WS	MS
Constant	2445.228*** (135.73)	495.410*** (3.83)
ρ	6663.873*** (909.01)	-24.498 (25.65)
ρ^2	-4219.784*** (927.94)	-38.029 (26.19)
R^2	.945	.908

*Significant at 10%

**Significant at 5%

***Significant at 1 %

Marriage Matching with Correlated Preferences

CONCLUSION

- Correlation is an important factor that affects the aggregate satisfaction of the participants.
- At the higher levels, correlation in proposers' lists becomes dominant over the favoring behavior of the algorithm.
i.e. in men-proposing version, higher correlation in men's list favors women and makes men worse off.
- Correlation in women's preference lists has no significant effect on men's satisfaction, while it adversely affects women's aggregate satisfaction.