ECON106/2214 Games and Decisions
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1 Introduction

In this paper I analyze singles party in Japan by using Game theory. Most of those parties are held by men group and women group composed of same number of persons in order to make couples. Because one-to-one matching can be allowed in making couples, it gives rise to highly strategic situations among the participants, which include tactics between the same sex and the other sex.

In the following paragraph, I show you the peculiar background of this game in Japan. After that I formalize this situation in game theoretic mode. And in the last paragraph I summarize the results and clarify the way of further studies.

2 Background

In most cases, singles parties are carried out by 4 or 5 men and women. They meet up to make couples. The main function of such parties is to make the time to talk with the members of the other group. After 2 or 3 hours, some participants can get the partner and other ones can not.

In the typical type of singles party in japan, the participants talk over a square table, with all men sitting on one side and all women sitting on the other side. Then they inevitably have more time to talk with the member sitting in front of them than the other members. The aim of this meeting is, however, finding the partner. And all people think the more choice is better. Thus "Sekigae" is done there. "Sekigae" is the Japanese term which means changing seats. By doing "Sekigae", they get the equal time to talk with all the members of the other sex group.

It is sure, however, that "Sekigae" deprives the participant of the time to make bigger the probability of getting a couple with each one candidate, because he or she could make a better impression on the future partner if he or she had the more time to talk with the person.

This trade off arises the strategic situation on the happy party. Then I analyze the condition which they should have "Sekigae" by using game theory. Furthermore I study the effect of quality gap in the same sex group. For simplification, in this paper, I consider only "2 men vs 2 women" situation, but the essence of the result will not change in more persons case.

The most important point of this paper is the definition of the success of this party. I define the success in this case by "all participants can get the partner" rather than "the expected number of members getting the partner". This is because almost all participants actually want their one-night stand rather than their companion for life through the party, and so the most essential purpose in the meeting is that all members have so good an experience that they are looking forward to the next party. According to this purpose, the success is "all participants can get the partner".

3 Analysis

3.1 No quality gap

First I formalize both group have no quality gap in each group.

Let A and B be two men, and a and b be two women. Then each man have two choices, i.e. a or b. And each woman also have two choices, i.e. A or B. In order to summarize the payoff, I write $[\alpha, \beta]$ as indicating "a chooses α and b chooses β ", and (α, β) as indicating "A chooses α and B chooses β ". The payoff matrix can be expressed as Table1 by using this notation, where x is the payoff of getting the partner and y is the payoff of no matching.

Women

		$[A,A]$	$[A,B]$	$[B,A]$	$[B.B]$
	(a,a)	(x,y,x,y)	(x,y,x,y)	(y,x,x,y)	(y,x,x,y)
Men	(a,b)	(x,y,x,y)	(x,x,x,x)	(y,y,y,y)	(y,x,y,x)
	(b,a)	(x,y,y,x)	(y,y,y,y)	(x,x,x,x)	(y,x,x,y)
	(b,b)	(x,y,y,x)	(y,x,y,x)	(x,y,y,x)	(y,x,y,x)

Table 1: no difference vs no difference

Given the communication skills of members are same, with "Sekigae", all members have the same amount of information about the other sex members. Then, letting $P_\alpha(\beta)$ be the probability of α chooses β, $P_A(a) = P_B(a) = P_a(A) = P_b(A) = \frac{1}{2}$. In this case, the probability of achieving $((a,b),[A,B])$ or $((b,a),[B,A])$ is $2\left(\frac{1}{2}\right)^4 = \frac{1}{8}$.

Women

		$[H,H]$	$[H,L]$	$[H,L]$	$[L.L]$
	(a,a)	(x,y,x_h,y)	(x,y,x_h,y)	(y,x,x_l,y)	(y,x,x_l,y)
Men	(a,b)	(x,y,x_h,y)	(x,x,x_h,x_l)	(y,y,y,y)	(y,x,y,x_l)
	(b,a)	(x,y,y,x_h)	(y,y,y,y)	(x,x,x_l,x_h)	(y,x,x_l,y)
	(b,b)	(x,y,y,x_h)	(y,x,y,x_l)	(x,y,y,x_h)	(y,x,y,x_l)

Table 2: difference vs no difference

b

		H	L
a	H	$(\frac{x_h+y}{2}, \frac{x_h+y}{2})$	$(\frac{x_h+y}{2}, \frac{x_l+y}{2})$
	L	$(\frac{x_l+y}{2}, \frac{x_h+y}{2})$	$(\frac{x_l+y}{2}, \frac{x_l+y}{2})$

Table 3: women's payoff matrix with change seats

4 Conclusion

		b	
		H	L
a	H	$((x_h - y)\theta + \frac{x_h+y}{2}, (y - x_h)\theta + \frac{x_h+y}{2})$	$((x_h - y)\theta + \frac{x_h+y}{2}, (x_l - y)\theta + \frac{x_l+y}{2})$
	L	$((y - x_l)\theta + \frac{x_l+y}{2}, (y - x_h)\theta + \frac{x_h+y}{2})$	$((y - x_l)\theta + \frac{x_l+y}{2}, (x_l - y)\theta + \frac{x_l+y}{2})$

Table 4: women's payoff matrix without change seats

		Women			
		$[H, H]$	$[H, L]$	$[H, L]$	$[L.L]$
Men	(h, h)	(x_h, y, x_h, y)	(x_h, y, x_h, y)	(y, x_h, x_l, y)	(y, x_h, x_l, y)
	(h, l)	(x_h, y, x_h, y)	(x_h, x_l, x_h, x_l)	(y, y, y, y)	(y, x_l, y, x_l)
	(l, h)	(x_l, y, y, x_h)	(y, y, y, y)	(x_l, x_h, x_l, x_h)	(y, x_h, x_l, y)
	(l, l)	(x_l, y, y, x_h)	(y, x_l, y, x_l)	(x_l, y, y, x_h)	(y, x_l, y, x_l)

Table 5: difference vs difference