Risk Taking and Gender: The Case of Bridge

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Introduction

Human behavior and risk taking kept researchers busy for many years in the past, and will continue in the future. On the one hand individuals display in certain situations risk aversion, and in others, that seem similar, risk taking. Also researches were interested in exploring the question of gender and risk taking. The purpose of this study is to look into that question using the setting of the card game of Bridge.

The game of Bridge provides a perfect natural setting to examine under identical conditions the behavior of males versus females. The competitive nature of the situation creates willingness to take risks, which can be very emotional as evidenced by the behavior of players toward their partners and opponents.

The game is divided into two parts: after the 52 card are dealt randomly to the players, the bidding process starts. The pair with the highest bid wins the contract, and then starts the second part of execution. In this study we will concentrate only on the contract. Our general assumption is that the higher the winning contract the greater the risk of failure. In other words, other things being equal, a declarer with a winning contract of 6 has a higher chance of failure compared to a declarer with a contract of 5, given that the cards dealt to each declarer are identical. As strange as it looks, it happens all the time. Two different players, at two different tables can obtain the same set of cards, and come to different conclusions based on many factors, and therefore are willing to take different levels of risk.

In order to examine the effect of gender, we compared tables consisting of male only against female only tables. The data was provided by the Bridge Festival that took place in February 2012 in Tel Aviv. Before the study started, a nonscientific survey was taken among Bridge experts (all males), and the general consensus was that men are more willing to take risks as compared to women.

Data Analysis

For analysis purposes 10 boards were selected at random out of 30 boards played. The 1st through the 8th boards were played 35 times each by male only tables, and 44 times each by female only tables. The 9th and 10th boards were played 35 times each by male only tables and 59 times each by female only. All boards together were played 350 times by male only and 470 times by female only for a total of 820. In order to rank the various contracts a scale was calculated to reflect the level and types of contracts achieved. That way the mean and standard deviation could be compared. The scale is presented in a form of a table:

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Scale of Possible Bids

Tricks	♣	♦	♥	♠	NT
1	1	2	3	4	5
2	6	7	8	9	10
3	11	12	13	14	15
4	16	17	18	19	20
5	21	22	23	24	25
6	26	27	28	29	30
7	31	32	33	34	35

This is an exhausted list where the lowest bid is 1♣ with scale value of 1, and the highest is 7NT with a scale value of 35. The possibility of double and redouble were ignored for now because it was felt that these options affect the score but not the risk taking behavior. The outcome of the analysis is in the following table:

Tel Aviv Festival Male vs. Female

Board	Gender	Sample Size	Mean	S.D.	Sig. at 5%
1st	M	35	14.26	3.364	No
	F	44	14.70	3.521	
2nd	M	35	18.54	2.811	Yes
	F	44	20.18	3.037	
3rd	M	35	16.69	2.610	Yes
	F	44	18.39	1.498	
4th	M	35	15.57	4.031	No
	F	44	16.80	4.723	
5th	M	35	11.83	3.674	No
	F	44	10.89	3.817	
6th	M	35	15.14	2.403	No
	F	44	15.00	1.121	
7th	M	35	20.23	4.925	No
	F	44	19.59	4.510	
8th	M	35	19.06	2.155	Yes
	F	44	17.98	2.063	
9th	M	35	14.83	3.884	Yes
	F	59	16.75	4.486	
10th	M	35	15.46	3.868	No
	F	59	14.76	4.276	
Full Game	M	253	17.88	3.222	No
	F	352	18.18	3.284	

We can see clearly that out of the 10 boards in our study, in 6 of them there was no significant difference between the mean declared by women versus men. Of the

remaining 4, where there was significant difference, in 3 the difference was in favor of women as risk takers, and only in the 8th board, men displayed a higher tendency to take risks as compared to women. It is very clear, just by looking at the table that women are at least equal to men if not higher in willingness to take risk. However in order to be on the safe side two more tests were conducted in order to validate the finding.

The first one was done only on those hands where a full game was the contract. Which in our scale was 15 (3NT) and 18 (4♥) to 35 (7NT). The logic behind it is that at lower levels, requiring 1 or 2 tricks the players do not perceive substantial risk. However as the number of trick required for making the contract increases, the perception of risk is increased. At the 35 level (7NT), there is no room for error in order to make the contract. As we can see from the last raw in the above table the results are the same. The average for women is a little higher but not significant statistically. This verifies the previous findings of at least equality between the sexes.

In the last test, we did take a look at the actual results, and compared it to the expected results against the winning bid. Bear in mind that in a perfect world, when all the information is available to all players all bids should be identical and equal to the outcome. But this of course is not the case. When we make the comparison three outcomes are possible: Bid=Outcome, Bid>Outcome, (this is a risk taker player because he bid more than he could have done) and Bid<Outcome, (this is a risk averter because he bid less). From the table below Chi Square was computed, and no statistically significance association was found between the two variables. 57.6% of the women were risk taker with only 42.4% of the men. As far as this test we have to be cautious because it involves playing the hand, which requires a different skill as compared to bidding. However we believe, taking into account that the process of the last test is "contaminated", because it goes beyond the bidding stage, it is consistent with the other findings.

Gender vs. Potential

(Tel Aviv)

			Potential			
			Equal	Risk avert	Risk Taker	Total
Gender	Male	Count	118	98	134	350
		% within potential	48.4%	37.7%	42.4%	42.7%
	Female	Count	126	162	182	470
		% within potential	51.6%	62.3%	57.6%	57.3%
Total		Count	244	260	316	820
		% within potential	100.0%	100.0%	100.0%	100.0%

After looking at the results, it occurred to us that perhaps the results we see are due to the fact that the Tel Aviv Festival is open to anyone, and therefore there is a wide difference in the level of players. So it was decided to use a different data base, the 14th World Bridge Games, which took place in Lille France in 2012. We selected at

random one round, in which there were 5 boards played 14 times each by all male and all female teams. The results are in the following table.

14th World Bridge Games, Lille France
Male vs. Female

Board	Gender	Sample Size	Mean	S.D.	Sig. at 5%
1st	M	14	16.71	2.054	Yes
	F	14	18.43	1.453	
2nd	M	14	11.36	2.468	no
	F	14	10.46	3.054	
3rd	M	14	12.93	2.495	No
	F	14	13.57	4.146	
4th	M	14	19.00	0.000	No
	F	14	19.36	1.436	
5th	M	14	17.14	1.406	No
	F	14	17.57	1.089	
Full Game	M	55	15.49	4.450	No
	F	62	15.94	3.844	

In these Games only national teams play. On the all women side the following national teams played: Ireland, USA, Japan, Austria, India, Indonesia, Chile, Denmark, Mexico, Israel, New Zealand, Netherlands, Reunion, San Marino. On the all men side: China Hong Kong, Brazil, Portugal, France, Estonia, Poland, Ukraine, San Marino, New Zealand, USA, Chinese Taipei, Austria, Pakistan and Ireland. Each country selects its best players to represent it. This should be reflected in the standard deviation of the bids. The better the players, the smaller will be the variation between them. We calculated the average standard deviation of the two groups and sure enough, the average S.D. of Tel Aviv = 3.3388 and Lille = 1.9501. This confirms what we suspected. The standard deviation in the open enrollment in Tel Aviv was 71% higher compared to Lille. Also it confirms what we found in the Tel Aviv sample that as far as bidding in the game of Bridge gender is not the variable that explains the difference. Women are equal to men as far as risk taking. To be on the safe side, we also ran the Chi Square test and here are the results:

Gender vs. Potential

(Lille)

			Potential			
			Equal	Risk avert	Risk taker	Total
Gender	w	Count	33	18	19	70
		% within potential	51.6%	47.4%	50.0%	50.0%
	m	Count	31	20	19	70
		% within potential	48.4%	52.6%	50.0%	50.0%
Total		Count	64	38	38	140
		% within potential	100.0%	100.0%	100.0%	100.0%

The Chi Square value was not significant, similar to Tel Aviv.

Conclusion

The general belief among so called experts is that women have a lower tendency to take risks in the setting of the game of Bridge as compared to men. One such expert even told me the explanation is genetic. Well the evidence presented here does not support that belief. Women are risk takers at least as men. The next stage of research is to examine the gender effect on the second part of the game, the hand play.