The Truth about Choosing a Date Partner

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19 March 2017

Introduction

The choice of a marriage partner is one of the most serious decisions people face. In contemporary Western societies, this decision usually follows a long learning period during which people engage in more informal and often polygamous relationships, i.e., dating, which is the topic of this paper.

In this way, dating is the first step to the important desition in our life. And what determines whether or not a meeting held?

Solution of this problem seems obvious: person must answer the question "What am I look for in the opposite sex?" Should she or he be attractiive or have a good sence of humor? Or maybe the partner should be ambitious and intelligent?

But does it solution works? Do respondents' answers at this question and real situation coincide? In this paper we will try determine it.

Data description

This paper besed on the data compiled by Columbia Business School professors Ray Fisman and Sheena Iyengar for their paper "Gender Differences in Mate Selection: Evidence From a Speed Dating Experiment".

Data was gathered from participants in experimental speed dating events from 2002 to 2004. During the events the attendees would have a four minute "first date" with every other participant of the opposite sex. At the end of their four minutes, participants were asked if they would like to see their date again.

They were also asked to rate their date on six attributes: Attractiveness, Sincerity, Intelligence, Fun, Ambition, and Shared Interests.Participants had 100 points to distribute among the following 6 attributes. They gave more points to those attributes that were more important and fewer points to those attributes that were less important in a potential date. Total points must equal 100.

In the same way participants answered three questions before and after dating:

1. What do you look for in the opposite sex?

2. What do you think MOST of your fellow men/women look for in the opposite sex?

3. What do you think the opposite sex looks for in a date?

The dataset also includes questionnaire data gathered from participants at different points in the process. These fields include: dating habits, self-perception across key attributes, beliefs on what others find valuable in a mate, and lifestyle information. These variables will not be used in this paper but they may be important for another approaches to research this data.

Opinions of the participants

Before the speed dating experiment the participants were asked which attributes they look for in opposite sex (picture 1, 2).

Women noted that their partner should be sincere in the first place, also he should be intelligent and attractive. Men marked that the most important quality for women is intelligence, then - joviality and attractivness.

After participants had been sent their matches they answered this question again.

Men changed their mind unsignificantly: they reduced intelligence just a little and added ambitiousness by the same amount.

Women turned out to be more unstable than men. They decided that even if they put sincerity in first place they still underestimated it. Therefore they added a couple more points for sincerity. Moreover, they reduced ambitiousness strong enough and intelligence.

Picture 1. Q1. Before.
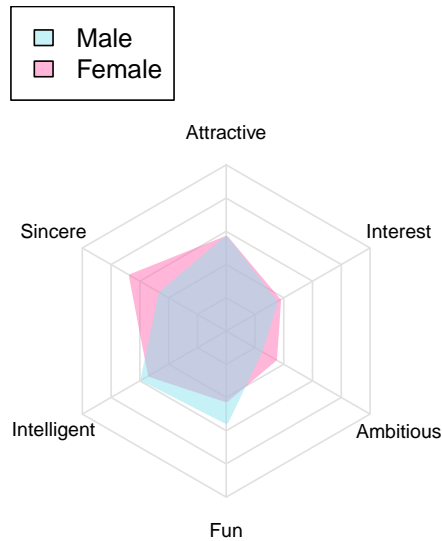
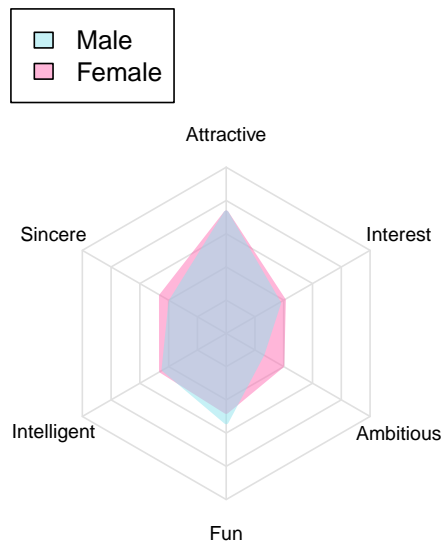
Picture 2. Q1. After
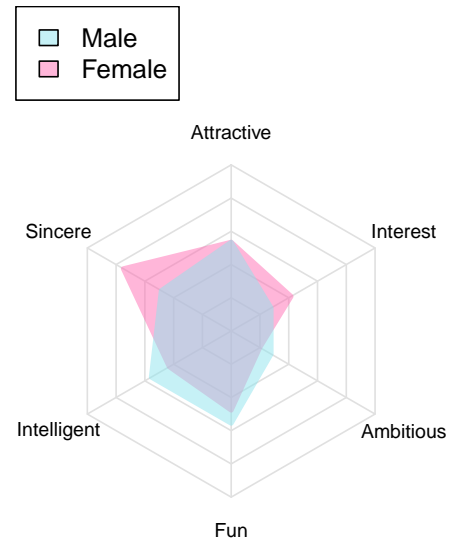
The next question was: "What do you think MOST of your fellow men/women look for in the opposite sex?"

How sometimes it happens - women adhered to the rule "I am not like others"at first. Of course, the most important quality for others is attractivness (picture 3, 4).
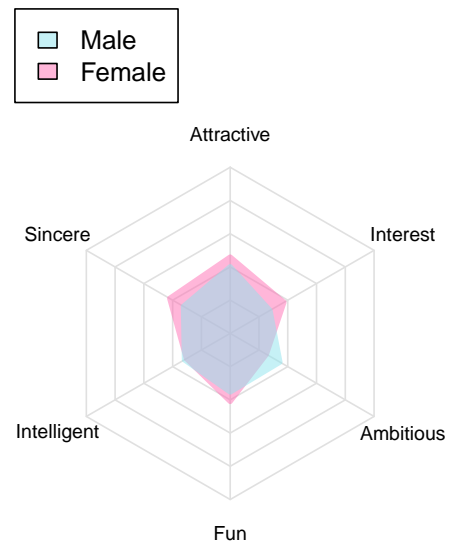
However, they radically changed their mind after the experiment. They examined the situation and chose fun and attractiveness as the main attributes.

What about men, first of all they noted attractiveness and fun. After dating they decided that ambitiousness is also important fot their fellow men.

Picture 3. Q2. Before

Male
Female

Attractive

Sincere

Interest

Intelligent

Ambitious

Fun

Picture 4. Q2. After

Male
Female

Attractive

Sincere

Interest

Intelligent

Ambitious

Fun

And the third question about opposite sex opinion (picture 5, 6).

Before the dating women think that men choose attractive and fun partners.

After the experiment they note also sincerity and common interests.
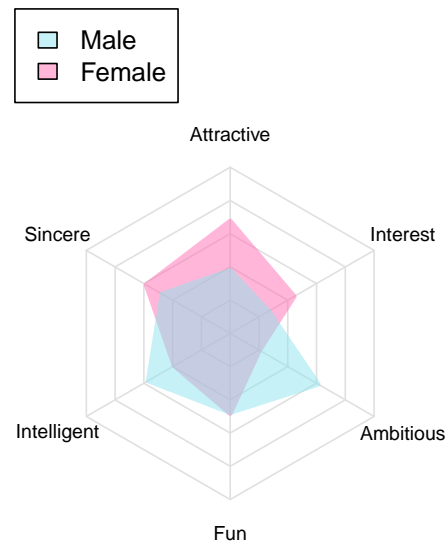
Men have the same point of view at the beginning. They note that women appreciate attractiveness and jocundity.

After they change their mind radically. "Women choose ambitious and intelligent partners", - they think.

Picture 5. Q3. Before
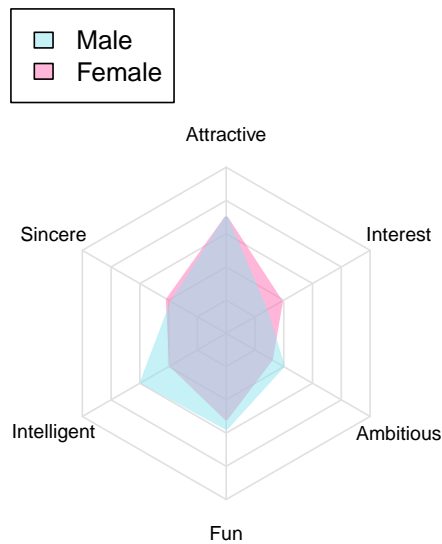
Picture 6. Q3. After

There are different points of view listed above but what is really going on? Did participants answered questions honestly? Or the choice of a partner is based on another priorities?

Independent analysis

For independent analysis we chose responses recieved by individual as dependent variable.

We calculated the average of all responces recieved by individual - Y. It is worth noting that 1 - invitation for the next date outside the experiment, 2 - opposite one.

We also calculated mean values of predictors for each individual and divided our dataset on results for women and men.
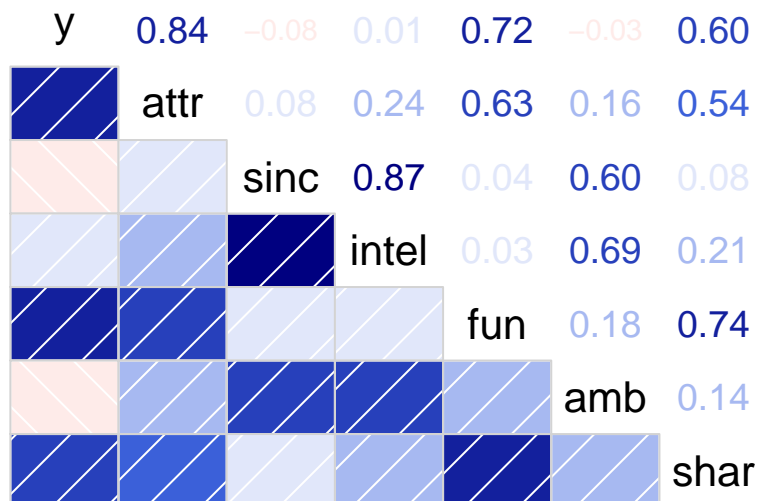
Correlation table for women shows that the strongest correlation is between responces and attractiveness, responces and fun, responces and ambitiousness (picture 7).

Picture 7. Correlations between variables for female

y	0.56	−0.21	0.16	0.43	0.44	0.35
	attr	−0.05	0.03	0.40	0.03	−0.15
		sinc	0.66	0.38	0.45	0.21
			intel	0.46	0.71	0.41
				fun	0.43	0.61
					amb	0.63
						shar

Correlation table for men displays that the strongest correlation is between responses and attractiveness, responses and fun, responces and common interests (picture 8).

Picture 8. Correlations between variables for male

y	0.84	−0.08	0.01	0.72	−0.03	0.60
	attr	0.08	0.24	0.63	0.16	0.54
		sinc	0.87	0.04	0.60	0.08
			intel	0.03	0.69	0.21
				fun	0.18	0.74
					amb	0.14
						shar

Despite the fact that necessary variables are already visible we make series of paired regressions for women and men in order to check importace of each variable.

Possessing the qualities *atractiveness*, *fun* and *ambitious* is important for women on 10 percent confidence level.

Based on the results of paired regression ideal men should be attractive, funny and have common interests with women. Thereat he will get a positive request.

Anyway we decided to make a full linear regression first of all. It looks like: $Y = attractive + sicere + intelligent + fun + ambitious$ *interests*. First model of regression is the same for men and women samples.

Wald test helps us to reject unnesessary variables and make the best model. Ho: True short model. If p-value > 0.1 -> we accept Ho and reject verifiable variable from regression. F shows how much our models differ.

Results of the test for women below. We decided to include variable to regression if p-value is less than 0.1 (10 percent confidence level).

```
##   Variable P.value      F Decision
## 1     attr 0.08815 3.6566  include
## 2     sinc 0.10480 3.2537   reject
## 3    intel 0.40570 0.7535   reject
## 4      amb 0.38710 0.8112   reject
## 5     shar 0.06638 4.0771  include
## 6      fun 0.49020 0.5067   reject
```

Regression for women after modification: $Y = attractive + sharedinterests$.

Wald test results for men:

```
##   Variable  P.value       F Decision
## 1     attr 0.006211 11.3820  include
## 2     sinc 0.892300  0.0192   reject
## 3    intel 0.699400  0.1565   reject
## 4      amb 0.150200  2.3387   reject
## 5     shar 0.824000  0.0513   reject
## 6      fun 0.070070  3.8041  include
```

Regression for men after modification: $Y = attractive + fun$.

Moreover, there are four principal assumptions which justify the use of linear regression models for purposes of inference or prediction:

1. Linearity and additivity of the relationship between dependent and independent variables (*residuals vs fitted*).

2. Normality of the error distribution (*normality*).

3. Homoscedasticity (constant variance) of the errors (*scale − location*).

4. Statistical independence of the errors (in particular, no correlation between consecutive errors in the case of time series data) (*residuals vs leverage*).

We can check conditions 1-4 of linear models using the graphs (pictures 9, 10).

1. Residuals vs Fitted.

This plot shows if residuals have non-linear patterns. There could be a non-linear relationship between predictor variables and an outcome variable and the pattern could show up in this plot if the model does not capture the non-linear relationship. If you find equally spread residuals around a horizontal line without distinct patterns, that is a good indication you do not have non-linear relationships.

We do not see any distinctive pattern in our cases.

2. Normal Q-Q.

This plot shows if residuals are normally distributed. It is good if residuals are lined well on the straight dashed line.
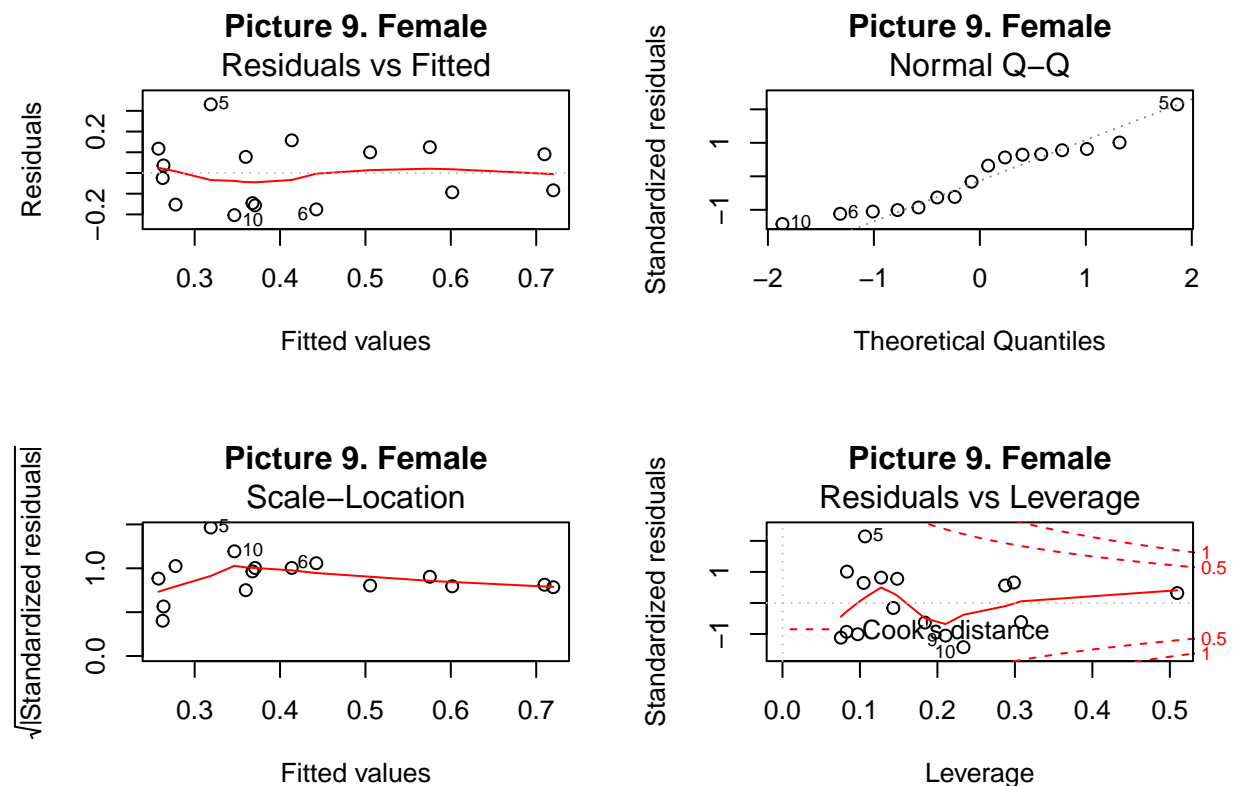
Everything is not ideal but OK.

    3. Scale-Location.

This plot shows if residuals are spread equally along the ranges of predictors.It is good if you see a horizontal line with equally (randomly) spread points.
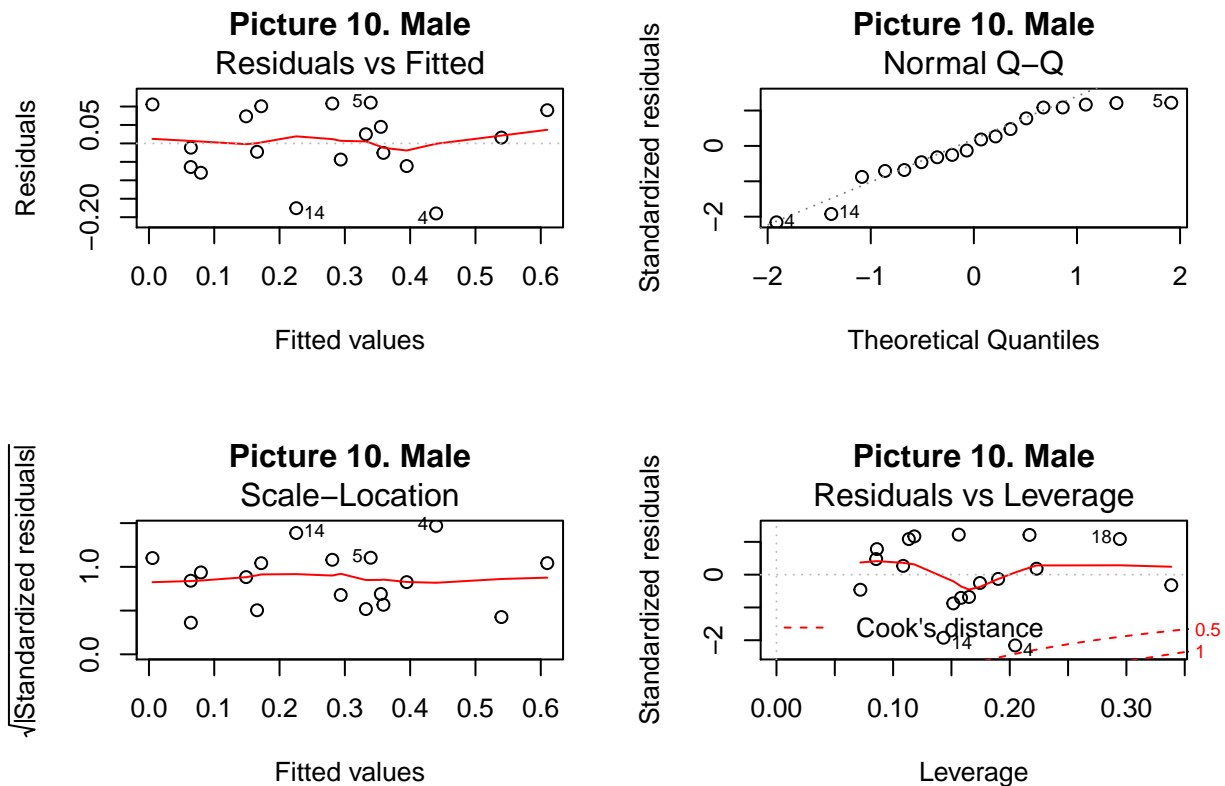
In our case the residuals appear randomly spread.

    4. Residuals vs Leverage.

This plot helps us to find influential subjects if any. Not all outliers are influential in linear regression analysis (whatever outliers mean). Even though data have extreme values, they might not be influential to determine a regression line. That means, the results would not be much different if we either include or exclude them from analysis. They follow the trend in the majority of cases and they do not really matter; they are not influential. On the other hand, some cases could be very influential even if they look to be within a reasonable range of the values. They could be extreme cases against a regression line and can alter the results if we exclude them from analysis. Another way to put it is that they don't get along with the trend in the majority of the cases.

Our case is the typical look when there is no influential cases. All cases are well inside of the Cook's distance lines.

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Picture 10. Male
Residuals vs Fitted

Picture 10. Male
Normal Q–Q

Picture 10. Male
Scale–Location

Picture 10. Male
Residuals vs Leverage

It is obvious that lin-lin model is better in both cases than log-lin model but we checked it using RE-test.

Ho: lin-lin model is true. Ho: log-lin model is true.

In both cases both models are true. However, P-value $(lin-lin)>$ P-value $(log-lin)$ so $lin-lin$ model is better.

```
## PE test
##
## Model 1: log(W$y) ~ W$attr + W$shar
## Model 2: W$y ~ W$attr + W$shar
##                           Estimate Std. Error t value Pr(>|t|)
## M1 + fit(M2)-exp(fit(M1))   0.4354     4.9250  0.0884   0.9310
## M2 + log(fit(M2))-fit(M1)  -0.2751     0.8875 -0.3100   0.7619

## PE test
##
## Model 1: log(M$y) ~ M$attr + M$fun
## Model 2: M$y ~ M$attr + M$fun
##                            Estimate Std. Error t value Pr(>|t|)
## M1 + fit(M2)-exp(fit(M1))  0.281871    0.35210  0.8005   0.4368
## M2 + log(fit(M2))-fit(M1) -0.040344    0.03957 -1.0197   0.3252
```

Also it is necessary to check omitted variables using Ramsey test. In both cases P-value > 0.05 -> we can accept Ho: no omitted variables.

```
##
##  RESET test
##
```

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```
## data:  men
## RESET = 0.30814, df1 = 2, df2 = 13, p-value = 0.74

##
##   RESET test
##
## data:  women
## RESET = 0.2287, df1 = 2, df2 = 11, p-value = 0.7993
```

It's time to look at the final regressions closer.

1) WOMEN.

Y = -1.39 + 0.16 *attractive* + 0.14 *common interests*

P-value = 0.009879 < 0.05 -> so we cannot accept the hypothesis of eqality of all coefficients to zero on 5% significance level.

To sum up, first of all men chose attractive women who also should have tha same interests or hobby.

2) MEN.

Y = -0.87 + 0.12 *attractive* + 0.08 *fun*

P-value = 0.00001688 < 0.05 -> so we cannot accept the hypothesis of eqality of all coefficients to zero on 5% significance level too.

During experiment women chose attractive men with good sence of humor.

Conclusion

Summing up all of the above, opinions of particiants and their actions are different. Only attractiveness was in the both cases.

Womens noted that the most important quality for men is sincerity. However, they did not choose partners relying on this attribute.

Men said that besides attractiveness women should be intelligent and fun but in reality these qualities have been replaced with common interests.

Thus, find a solution by simply answering a question "What do you look for in the opposite sex?" does not work out.

Why is it happen? Which factors influence on people's choice in such situations? It is a good question for future researches.

Bibliography

1. Fishman P., Iyengar S. S., Kamenika E., Simonson I. Gender Differences in Mate Selection: Evidence From a Speed Dating Experiment // The Quarterly Journal of Economics. 2006. P. 673-696.