Speed Dating Dataset

CIS9655 Final Project by Huida Shi

Data Set Link

https://data.world/annavmontoya/speed-dating-experiment

Data Overview

Dataset contains columns which is explained by a doc file on github.

This is a dataset on a speed dating experiment. Each person have a chance to meet 10 different people. People were given questionaires before the experiment and after each meeting rating their partners. The surverys are extremely insightful in many different way. Lets take a deep dive into this dataset and analyze on dating behavior!

LOAD DATA

In [1]:
```
import warnings
import pandas as pd
import matplotlib.pyplot as plt
from math import pi
import seaborn as sns
import scipy.stats as stat
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
```

In [2]:
```
warnings.filterwarnings("ignore")
```

In [4]:
```
df_full=pd.read_csv('/Users/davidshi/dating-master/SpeedDatingData.csv',encoding="ISO-8859-1")
```

In [5]:
```
df_full.head()
```

Out[5]:

	iid	id	gender	idg	condtn	wave	round	position	positin1	order	...	attr3_3	sinc3_3	intel3_3	fun3_3	amb3_3	attr5_3	sinc5_3
0	1	1.0	0	1	1	1	10	7	NaN	4	...	5.0	7.0	7.0	7.0	7.0	NaN	NaN
1	1	1.0	0	1	1	1	10	7	NaN	3	...	5.0	7.0	7.0	7.0	7.0	NaN	NaN
2	1	1.0	0	1	1	1	10	7	NaN	10	...	5.0	7.0	7.0	7.0	7.0	NaN	NaN
3	1	1.0	0	1	1	1	10	7	NaN	5	...	5.0	7.0	7.0	7.0	7.0	NaN	NaN
4	1	1.0	0	1	1	1	10	7	NaN	7	...	5.0	7.0	7.0	7.0	7.0	NaN	NaN

5 rows × 195 columns

In [6]:
```
df_full.describe()
```

Out[6]:

	iid	id	gender	idg	condtn	wave	round	position	positin1	orde
count	8378.000000	8377.000000	8378.000000	8378.000000	8378.000000	8378.000000	8378.000000	8378.000000	6532.000000	8378.00000
mean	283.675937	8.960248	0.500597	17.327166	1.828837	11.350919	16.872046	9.042731	9.295775	8.92766
std	158.583367	5.491329	0.500029	10.940735	0.376673	5.995903	4.358458	5.514939	5.650199	5.47700
min	1.000000	1.000000	0.000000	1.000000	1.000000	1.000000	5.000000	1.000000	1.000000	1.00000
25%	154.000000	4.000000	0.000000	8.000000	2.000000	7.000000	14.000000	4.000000	4.000000	4.00000
50%	281.000000	8.000000	1.000000	16.000000	2.000000	11.000000	18.000000	8.000000	9.000000	8.00000
75%	407.000000	13.000000	1.000000	26.000000	2.000000	15.000000	20.000000	13.000000	14.000000	13.00000
max	552.000000	22.000000	1.000000	44.000000	2.000000	21.000000	22.000000	22.000000	22.000000	22.00000

8 rows × 187 columns

In [7]:
```
df_full[['iid','pid']][(df_full['iid']==3)]
```

Out[7]:

	iid	pid
20	3	11.0
21	3	12.0
22	3	13.0
23	3	14.0
24	3	15.0
25	3	16.0
26	3	17.0
27	3	18.0
28	3	19.0
29	3	20.0

In [8]:
```
df_full.shape
```

Out[8]:
```
(8378, 195)
```

Shape of data is 8378 rows, 195 attributes.

In [9]:
```
pd.options.display.max_rows = 10
df_full.isnull().sum()
```

Out[9]:
```
iid          0
id           1
gender       0
idg          0
condtn       0
            ...
attr5_3   6362
sinc5_3   6362
intel5_3  6362
fun5_3    6362
amb5_3    6362
Length: 195, dtype: int64
```

so many null values. Let's create a second DataFrame representing each participant only once

In [10]:
```
identity = ['iid','wave','age','gender']
df_age = df_full[identity].drop_duplicates().copy()
```

In [11]:
```
df_age.gender.value_counts(dropna=False)
```

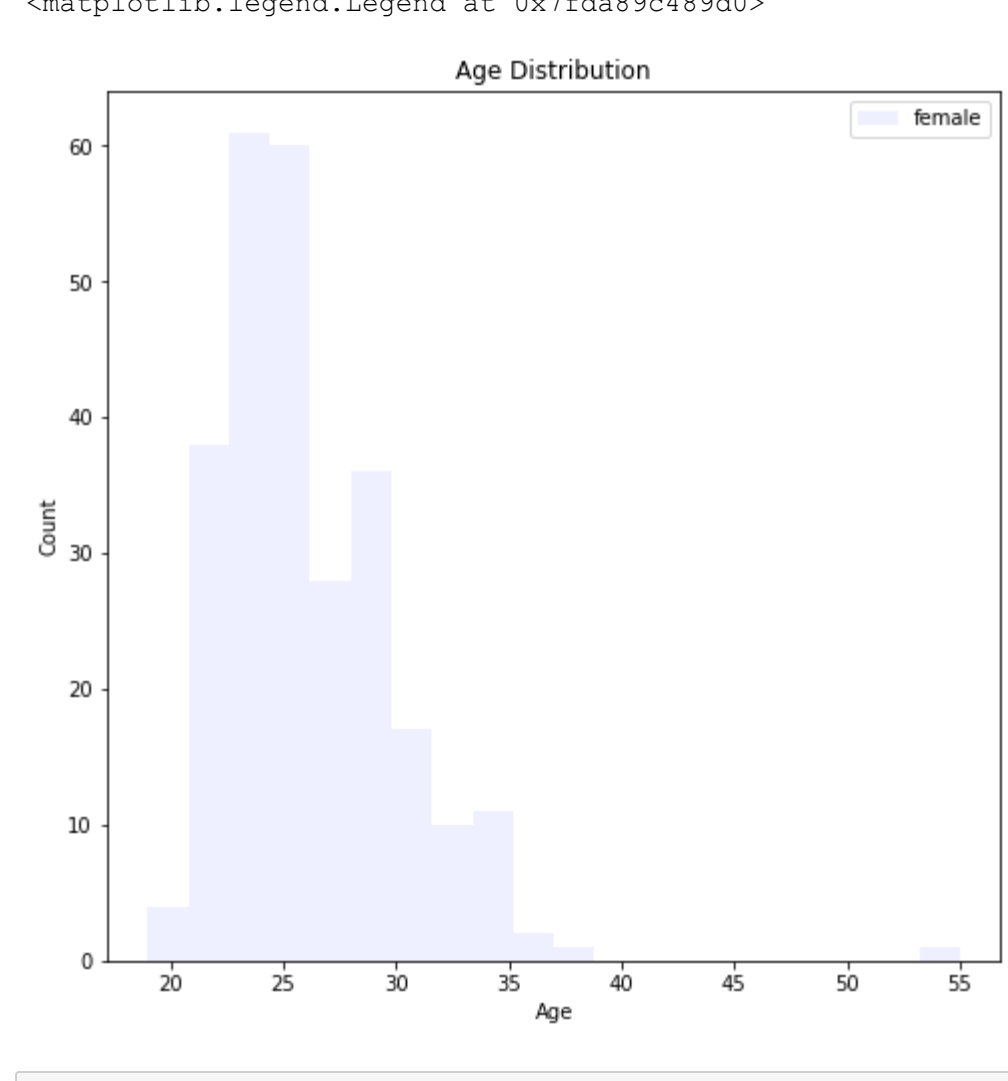
Out[11]:
```
1    277
0    274
Name: gender, dtype: int64
```

1 = male
0 = female

AGE DISTRIBUTION

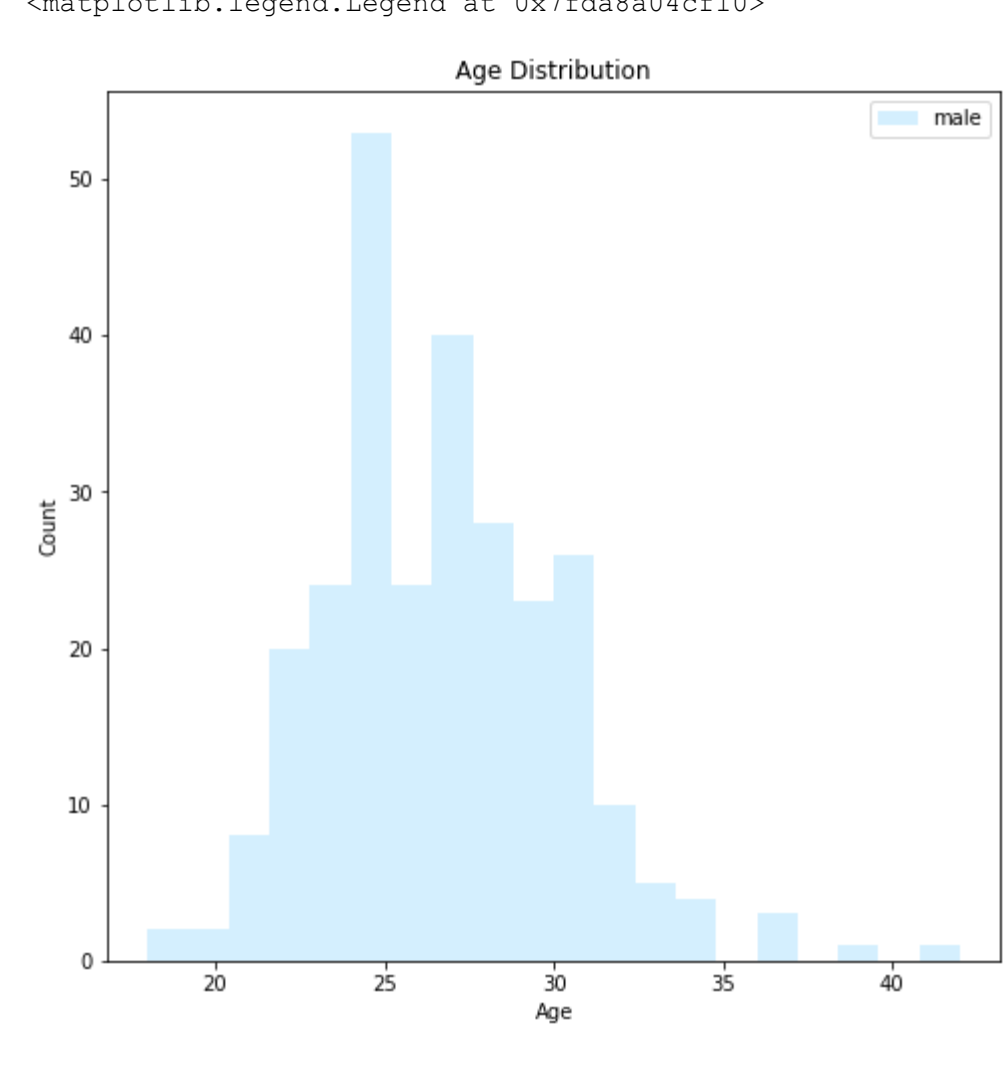
In [16]:
```
dfboy=df_age[df_age['gender']==1]
dfgirl=df_age[df_age['gender']==0]
plt.figure(figsize=(8,8))
plt.hist(dfgirl['age'],bins=20,color='#eeefff',alpha=1, label = 'female')

plt.title('Age Distribution')
plt.ylabel('Count')
plt.xlabel('Age')
plt.legend(loc = 'upper right')
```

Out[16]: <matplotlib.legend.Legend at 0x7fda89c489d0>



In [19]:
```
plt.figure(figsize=(8,8))
plt.hist(dfboy['age'],bins=20,color='#72CCFD',alpha=0.3, label = 'male')

plt.title('Age Distribution')
plt.ylabel('Count')
plt.xlabel('Age')
plt.legend(loc = 'upper right')
```

Out[19]: <matplotlib.legend.Legend at 0x7fda8a04cf10>



Histogram of female is more right skewed than male. This means female average age is lower than male average age in this speed dating experiment. Women have more pressure to get married earlier from society because theres a stigma with single older women. In addition women have a shorter biological clock to mate due to decrease quality in eggs at older ages. There is a count difference due to the presence of Na's in the age column

Attribute Analysis by Visual

Next I want to take a look at what attributes people think are most important. Participants were given a questionnaire before the speed date rounds. There is a section where participants are asked what they look for in the opposite sex. They are asked to allocated 100 points between 6 characteristics.

intel1_1 : intelligence
sinc1_1 : sincere
attr1_1 : attractive
fun1_1 : fun
amb1_1 : ambition
shar1_1 : shared interest

Reference used to make radar charts https://python-graph-gallery.com/391-radar-chart-with-several-individuals/

In [12]:
```
attribute = ['attractive', 'sincere','intelligence','fun','ambition','interest']
categories = ['attr1_1','sinc1_1','intel1_1','fun1_1','amb1_1','shar1_1']
df_want = df_full[['iid', 'wave', 'gender'] + categories].drop_duplicates().copy()
```

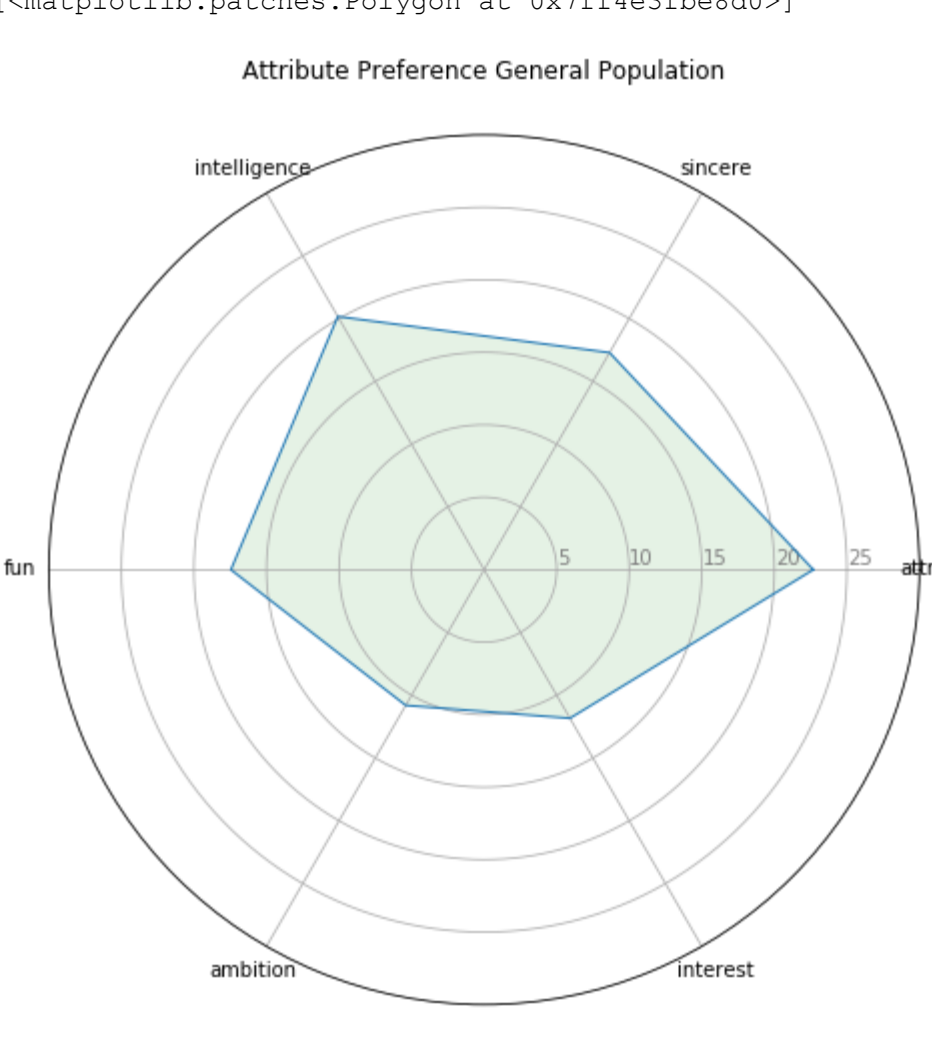
In [13]:
```
df_want.shape
```

Out[13]:
```
(551, 9)
```

In [14]:
```
N = len(categories)
values=[df_want.attr1_1.mean(),
        df_want.sinc1_1.mean(),
        df_want.intel1_1.mean(),
        df_want.fun1_1.mean(),
        df_want.amb1_1.mean(),
        df_want.shar1_1.mean(),
        df_want.attr1_1.mean()]
```

In [15]:
```
angles = [n/ float(N) * 2 * pi for n in range (N)]
angles += angles[:1]
plt.figure(figsize=(8,8))
ax = plt.subplot(111, polar=True)
plt.xticks(angles[:-1], attribute)
ax.set_rlabel_position(0)
plt.yticks([5,10,15,20,25], ['5','10','15','20','25'], color="grey", size=10)
plt.ylim(0,30)
plt.title('Attribute Preference General Population')
ax.plot(angles, values, linewidth=1, linestyle='solid')
ax.fill(angles, values, 'g', alpha=0.1)
```

Out[15]: [<matplotlib.patches.Polygon at 0x7ff4e3fbe8d0>]



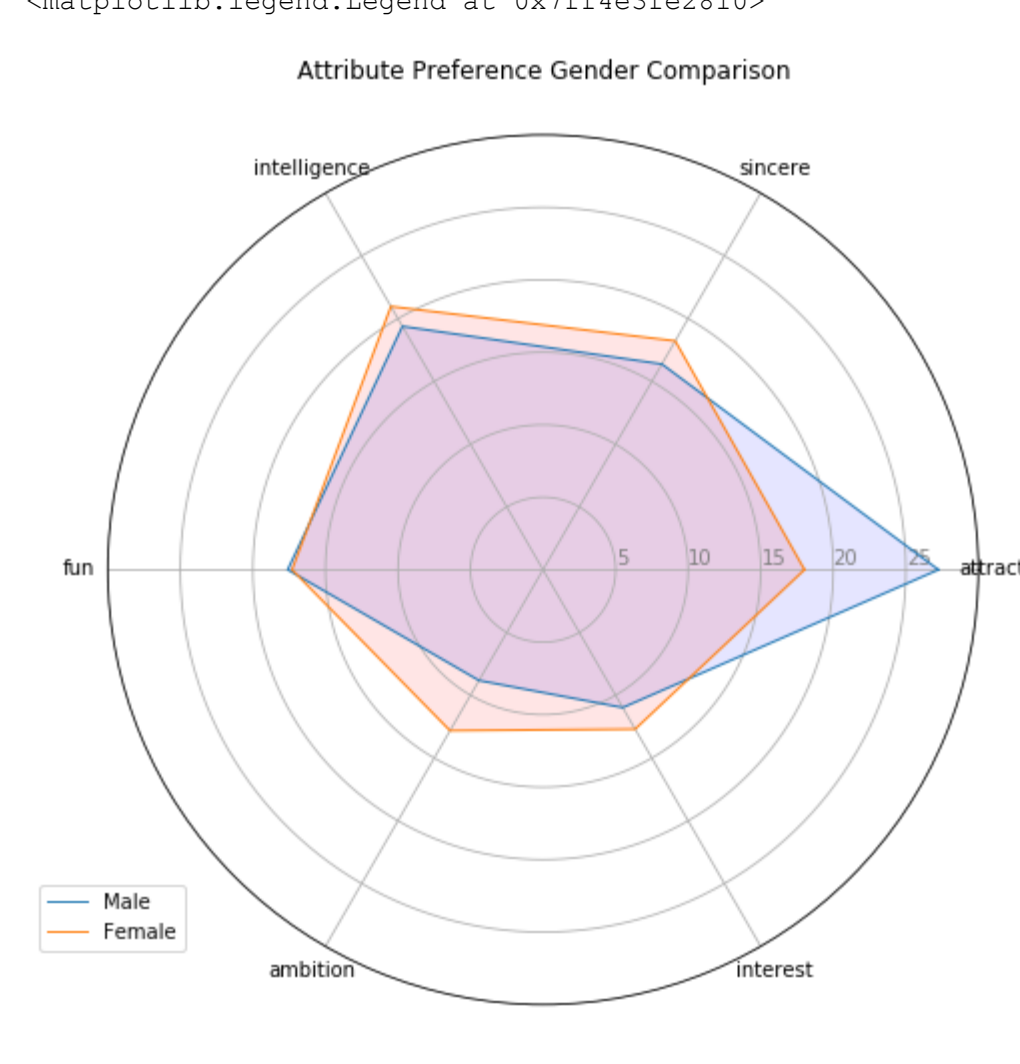
Attractivness have the highest value compared to the other attributes. Intelligence came as a close second. Ambition and shared interest have the lowest value. Physical looks have a average close to 25/100. If we lived in a advanced world where people have total ratings, 25% of it will be based on physical appearance.

In [16]:
```
values_m=[df_want[df_want['gender']==1].attr1_1.mean(),
        df_want[df_want['gender']==1].sinc1_1.mean(),
        df_want[df_want['gender']==1].intel1_1.mean(),
        df_want[df_want['gender']==1].fun1_1.mean(),
        df_want[df_want['gender']==1].amb1_1.mean(),
        df_want[df_want['gender']==1].shar1_1.mean(),
        df_want[df_want['gender']==1].attr1_1.mean()]
```

In [17]:
```
values_f=[df_want[df_want['gender']==0].attr1_1.mean(),
        df_want[df_want['gender']==0].sinc1_1.mean(),
        df_want[df_want['gender']==0].intel1_1.mean(),
        df_want[df_want['gender']==0].fun1_1.mean(),
        df_want[df_want['gender']==0].amb1_1.mean(),
        df_want[df_want['gender']==0].shar1_1.mean(),
        df_want[df_want['gender']==0].attr1_1.mean()]
```

In [18]:
```
plt.figure(figsize=(8,8))
ax = plt.subplot(111, polar=True)
plt.xticks(angles[:-1], attribute)
ax.set_rlabel_position(0)
plt.yticks([5,10,15,20,25], ['5','10','15','20','25'], color="grey", size=10)
plt.ylim(0,30)
plt.title('Attribute Preference Gender Comparison')
ax.plot(angles, values_m, linewidth=1, linestyle='solid', label="Male")
ax.fill(angles, values_m, 'b', alpha=0.1)
ax.plot(angles, values_f, linewidth=1, linestyle='solid', label="Female")
ax.fill(angles, values_f, 'r', alpha=0.1)
plt.legend(loc='right', bbox_to_anchor=(0.1, 0.1))
```

Out[18]: <matplotlib.legend.Legend at 0x7ff4e3fe2810>



Men looks for attractivness, women look for intelligence. Are men really that shallow? This chart looks ridiculous. I guess I am very different from the average male, I value ambition to a large extent.

I want to make another interesting comparison, participants are asked what they think the OPPOSITE sex looks for. I want to see if participants prediction closely reflect to the truth.

In [19]:
```
categories2 = ['attr2_1','sinc2_1','intel2_1','fun2_1','amb2_1','shar2_1']
df_want2 = df_full[['iid', 'wave', 'gender'] + categories2].drop_duplicates().copy()
```

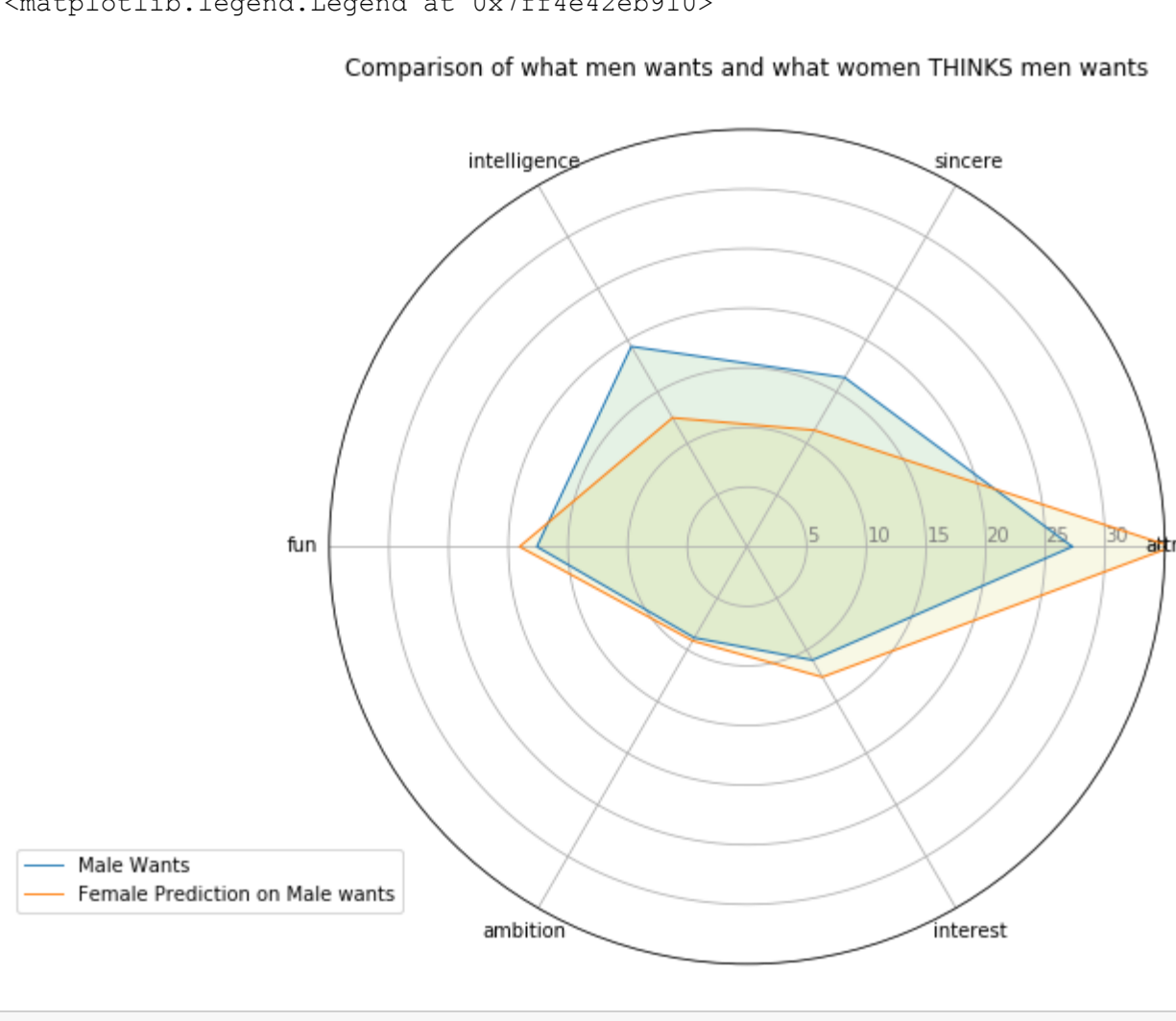
In [20]:
```
values_m_pred=[df_want2[df_want2['gender']==1].attr2_1.mean(),
        df_want2[df_want2['gender']==1].sinc2_1.mean(),
        df_want2[df_want2['gender']==1].intel2_1.mean(),
        df_want2[df_want2['gender']==1].fun2_1.mean(),
        df_want2[df_want2['gender']==1].amb2_1.mean(),
        df_want2[df_want2['gender']==1].shar2_1.mean(),
        df_want2[df_want2['gender']==1].attr2_1.mean()]
```

In [21]:
```
values_f_pred=[df_want2[df_want2['gender']==0].attr2_1.mean(),
        df_want2[df_want2['gender']==0].sinc2_1.mean(),
        df_want2[df_want2['gender']==0].intel2_1.mean(),
        df_want2[df_want2['gender']==0].fun2_1.mean(),
        df_want2[df_want2['gender']==0].amb2_1.mean(),
        df_want2[df_want2['gender']==0].shar2_1.mean(),
        df_want2[df_want2['gender']==0].attr2_1.mean()]
```

values_m_pred : what men think women looks for
values_f_pred : what women think men look for

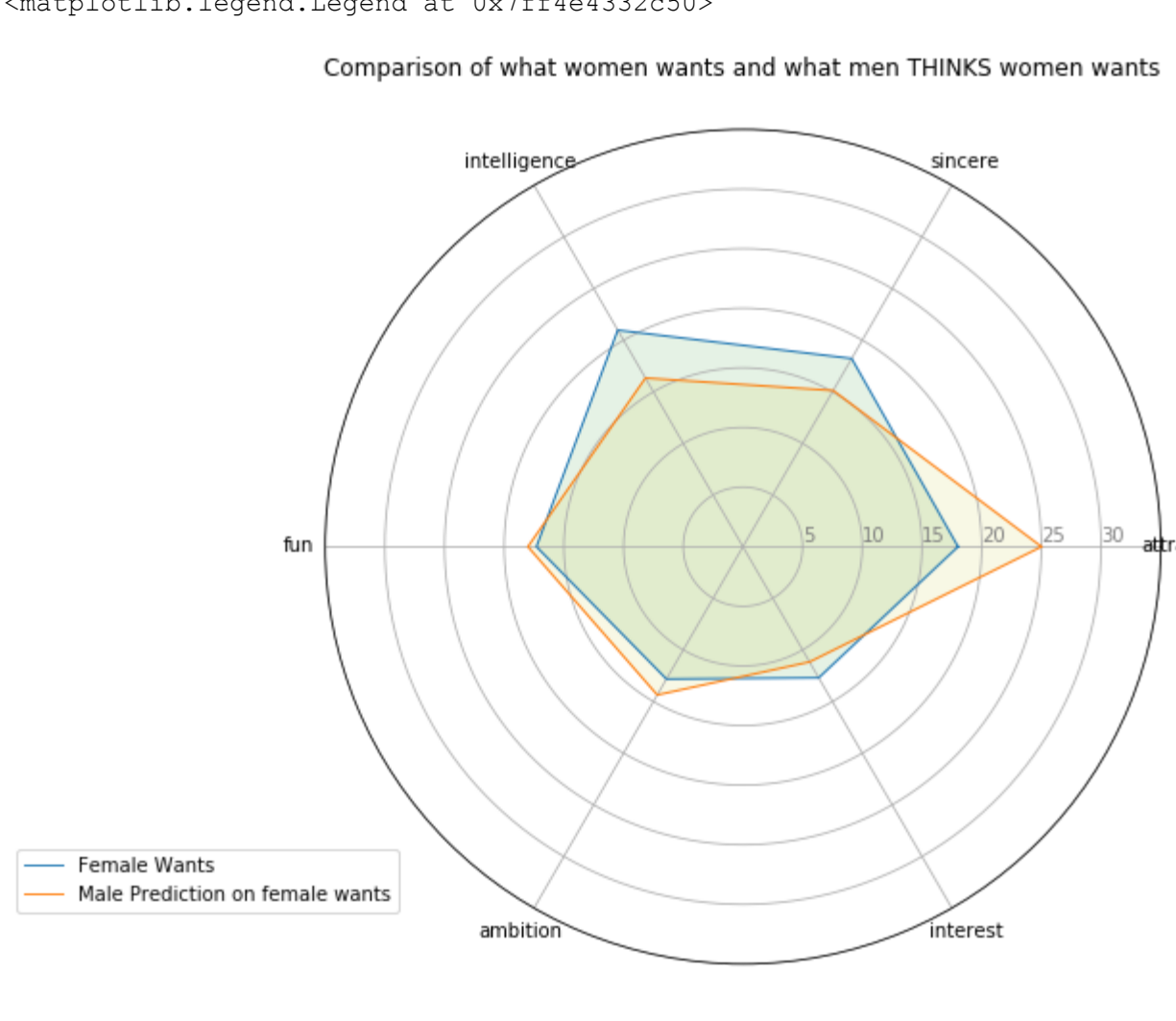
In [22]:
```
plt.figure(figsize=(8,8))
ax = plt.subplot(111, polar=True)
plt.xticks(angles[:-1], attribute)
ax.set_rlabel_position(0)
plt.yticks([5,10,15,20,25,30], ['5','10','15','20','25','30'], color="grey", size=10)
plt.ylim(0,35)
plt.title('Comparison of what men wants and what women THINKS men wants')
ax.plot(angles, values_m, linewidth=1, linestyle='solid', label="Male Wants")
ax.fill(angles, values_m, 'g', alpha=0.1)
ax.plot(angles, values_f_pred, linewidth=1, linestyle='solid', label="Female Prediction on Male wants")
ax.fill(angles, values_f_pred, 'y', alpha=0.1)
plt.legend(loc='right', bbox_to_anchor=(0.1, 0.1))
```

Out[22]: <matplotlib.legend.Legend at 0x7ff4e42eb910>



In [23]:
```
plt.figure(figsize=(8,8))
ax = plt.subplot(111, polar=True)
plt.xticks(angles[:-1], attribute)
ax.set_rlabel_position(0)
plt.yticks([5,10,15,20,25,30], ['5','10','15','20','25','30'], color="grey", size=10)
plt.ylim(0,35)
plt.title('Comparison of what women wants and what men THINKS women wants')
ax.plot(angles, values_f, linewidth=1, linestyle='solid', label="Female Wants")
ax.fill(angles, values_f, 'g', alpha=0.1)
ax.plot(angles, values_m_pred, linewidth=1, linestyle='solid', label="Male Prediction on female wants")
ax.fill(angles, values_m_pred, 'y', alpha=0.1)
plt.legend(loc='right', bbox_to_anchor=(0.1, 0.1))
```

Out[23]: <matplotlib.legend.Legend at 0x7ff4e4332c50>



wow what a surprise. Both genders underestimated how much people value intelligence/sincerity and overestimated the importance of attractivenss. This is great news for all the ugly people out there!

Attribute Analysis by Statistics

I want to analyze what attribute have the most effect on success rate. Success rate is calculated by

dec_o for unique iid (number of people who said yes to the participant) / total row of data for unique iid (number of total dates)

attributes were calculated by averaging what partners rated the person. attributes is plotted against success rate to find strength of linear relationship

Lastly I did a correlation chart between attributes and success rate

attr_o = ATTRACTION
sinc_o = SINCERE
intel_o = INTELLIGENCE
fun_o = FUN
amb_o = AMBITION
shar_o = SHARED INTEREST

In [20]:
```
df_psy=df_full[['iid', 'wave','exphappy','age','field','field_cd','expnum','race']].drop_duplicates().c
opy()
```

In [25]:
```
df_psy=df_psy.set_index('iid')
```

In [26]:
```
temp = df_full.groupby(['iid']).count()
```

In [27]:
```
df_psy['# of dates'] = temp['id']
```

In [28]:
```
df_psy['# of yes'] = df_full.groupby(['iid']).dec_o.sum()
```

In [29]:
```
df_psy['success rate'] = df_psy['# of yes'] / df_psy['# of dates']
```

In [30]:
```
df_psy
```

Out[30]:

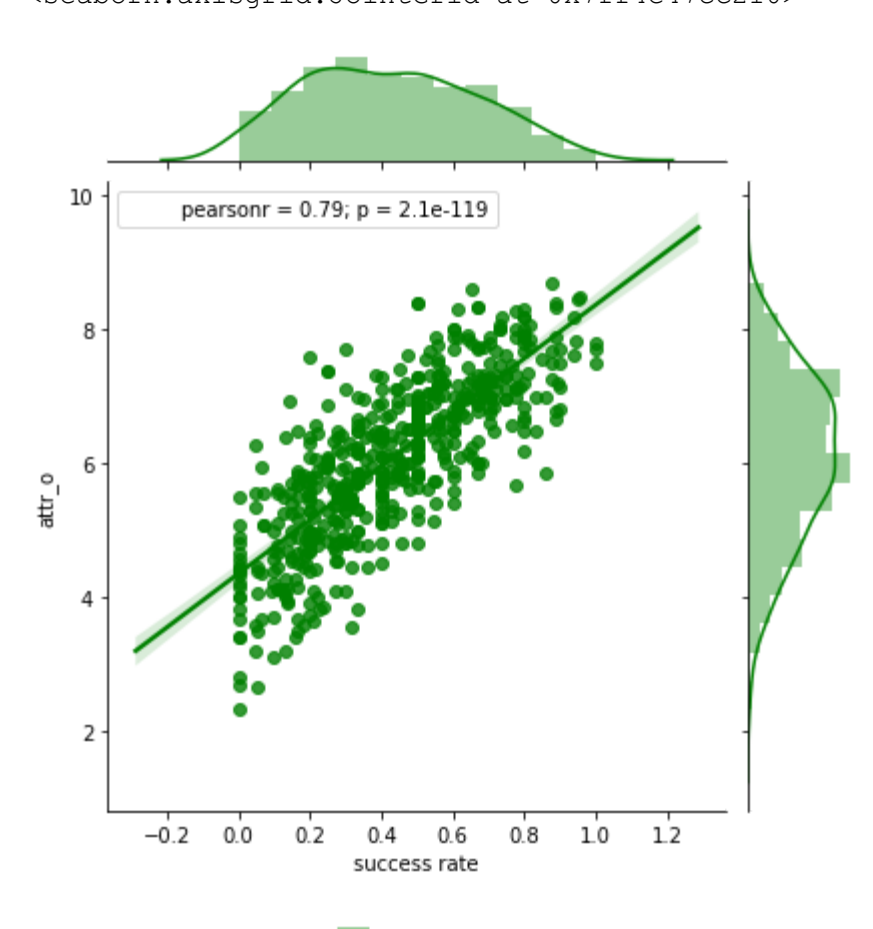
iid	wave	exphappy	age	field	field_cd	expnum	race	# of dates	# of yes	success rate
1	1	3.0	21.0	Law	1.0	2.0	4.0	10	5	0.500000
2	1	4.0	24.0	law	1.0	5.0	2.0	10	6	0.600000
3	1	4.0	25.0	Economics	2.0	2.0	2.0	10	5	0.500000
4	1	1.0	23.0	Law	1.0	2.0	2.0	10	6	0.600000
5	1	7.0	21.0	Law	1.0	10.0	2.0	10	3	0.300000
...	...	...	...	...	...	...	...	...	...	...
548	21	7.0	30.0	Business	8.0	NaN	2.0	22	10	0.454545
549	21	5.0	28.0	General management/finance	8.0	NaN	2.0	22	10	0.454545
550	21	7.0	30.0	MBA	8.0	NaN	2.0	22	6	0.272727
551	21	3.0	27.0	Business	8.0	NaN	1.0	22	10	0.454545
552	21	10.0	25.0	Climate Dynamics	18.0	NaN	2.0	21	15	0.714286

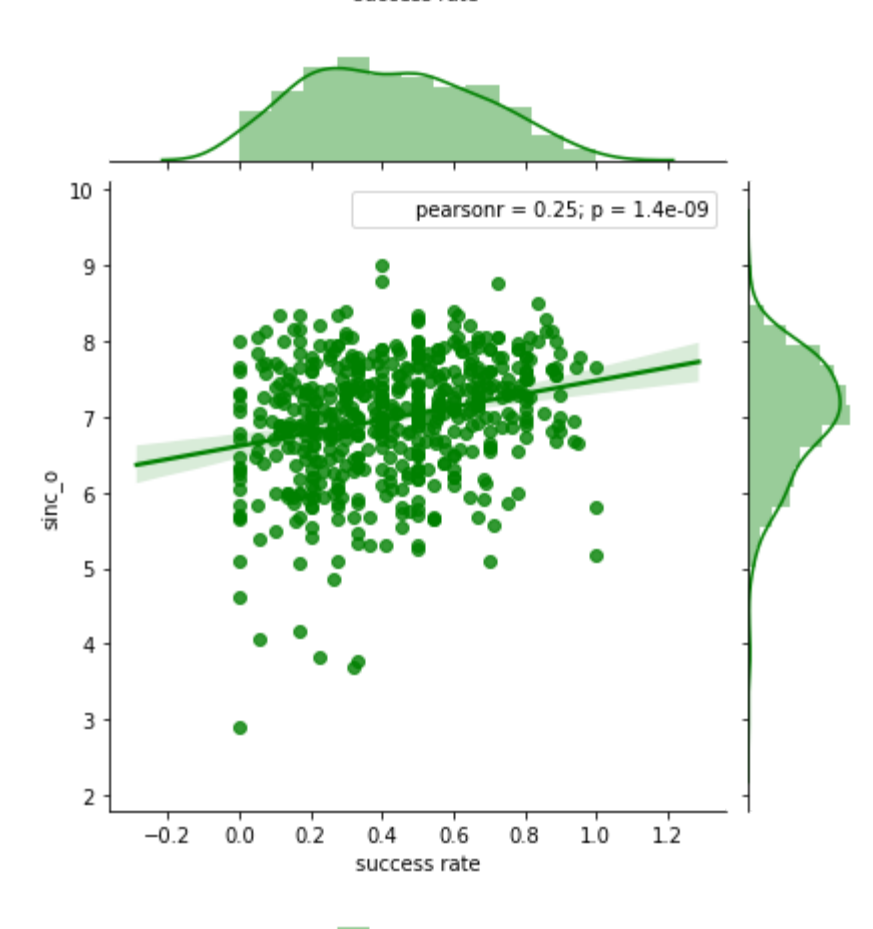
551 rows × 10 columns

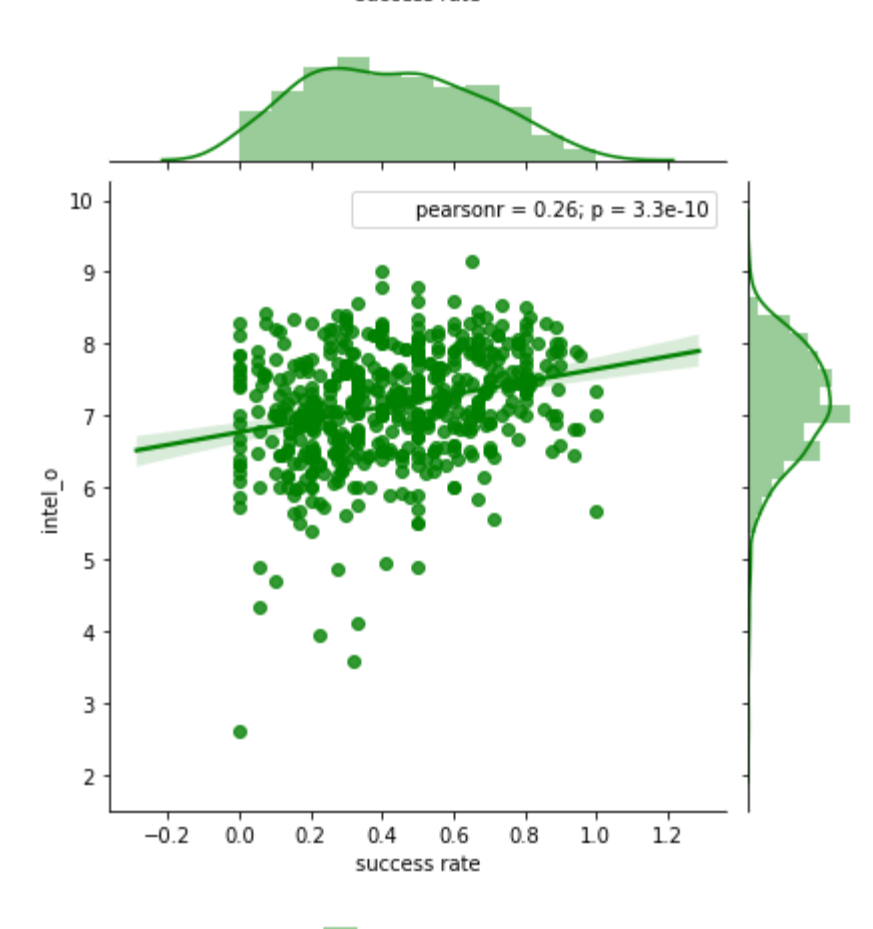
In [31]:
```
df_psy['attr_o'] = df_full.groupby(['iid']).attr_o.sum() / df_psy['# of dates']
df_psy['sinc_o'] = df_full.groupby(['iid']).sinc_o.sum() / df_psy['# of dates']
df_psy['intel_o'] = df_full.groupby(['iid']).intel_o.sum() / df_psy['# of dates']
df_psy['fun_o'] = df_full.groupby(['iid']).fun_o.sum() / df_psy['# of dates']
df_psy['amb_o'] = df_full.groupby(['iid']).amb_o.sum() / df_psy['# of dates']
df_psy['shar_o'] = df_full.groupby(['iid']).shar_o.sum() / df_psy['# of dates']
```

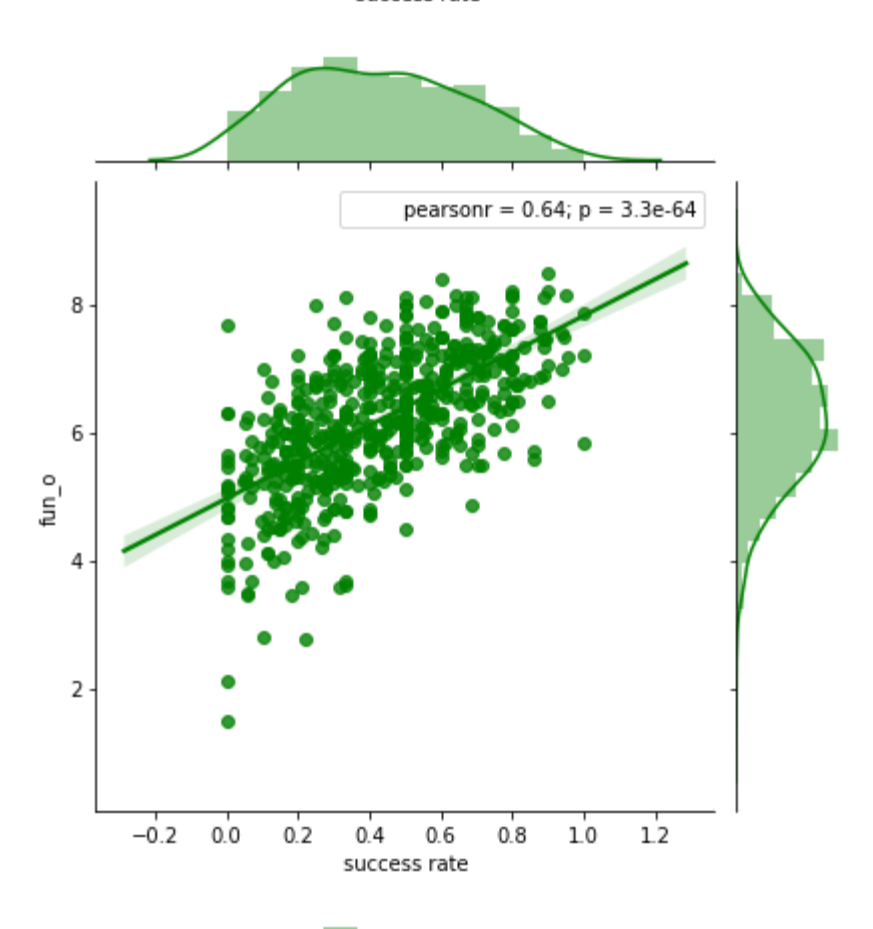
In [32]:
```
#figure, (ax1, ax2) = plt.subplots(ncols=2, sharey=True,figsize=(12,6))
sns.jointplot(x="success rate", y="attr_o", data=df_psy, color = 'g', kind="reg",stat_func=stat.pearson
r)
sns.jointplot(x="success rate", y="sinc_o", data=df_psy, color = 'g', kind="reg",stat_func=stat.pearson
r)
sns.jointplot(x="success rate", y="intel_o", data=df_psy, color = 'g', kind="reg",stat_func=stat.pearso
nr)
sns.jointplot(x="success rate", y="fun_o", data=df_psy, color = 'g', kind="reg",stat_func=stat.pearsonr
)
sns.jointplot(x="success rate", y="amb_o", data=df_psy, color = 'g', kind="reg",stat_func=stat.pearsonr
)
sns.jointplot(x="success rate", y="shar_o", data=df_psy, color = 'g', kind="reg",stat_func=stat.pearson
r)
```

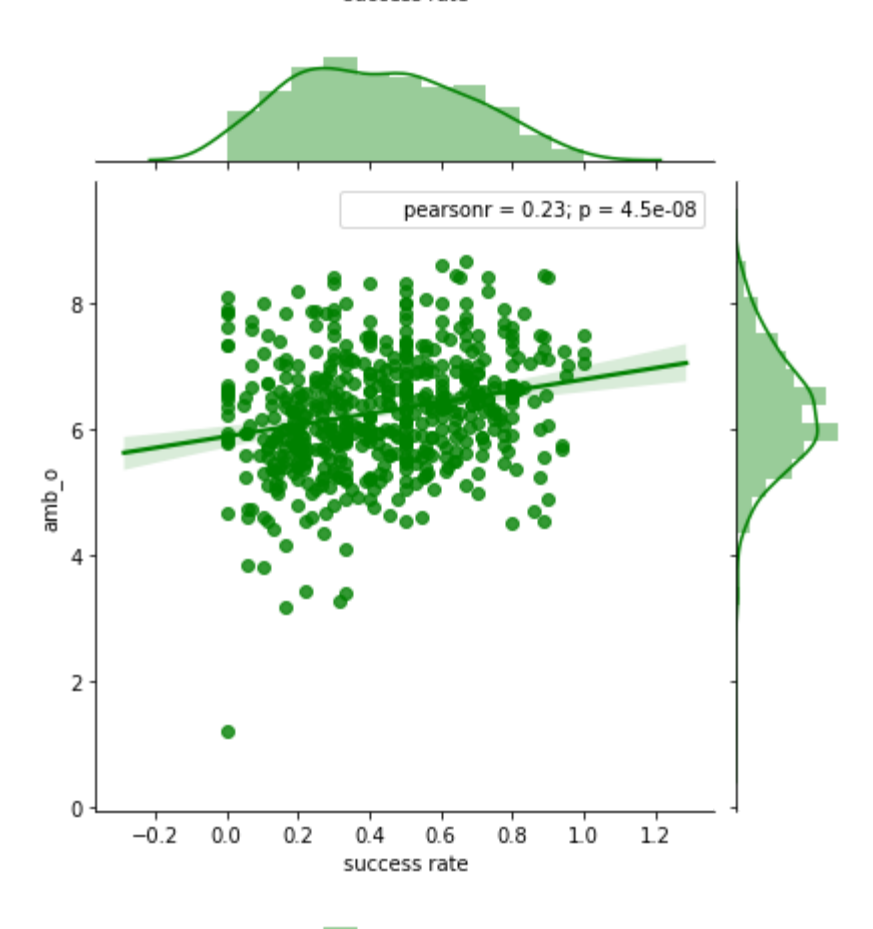
Out[32]: <seaborn.axisgrid.JointGrid at 0x7ff4e47cc210>

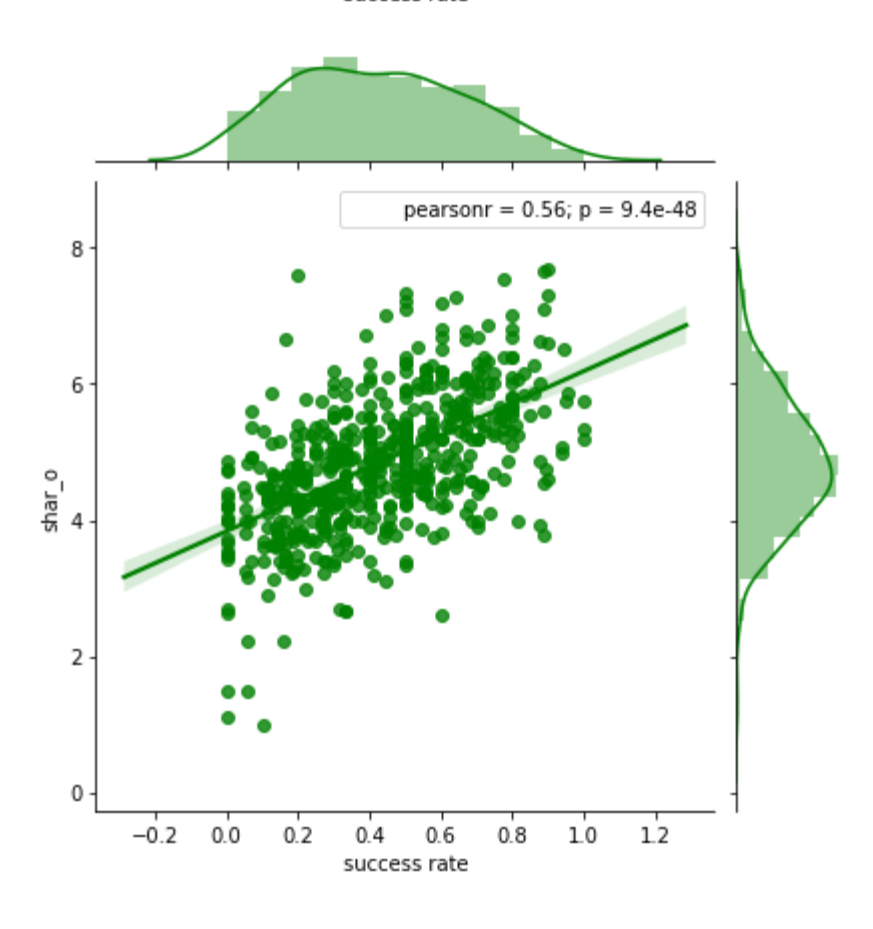








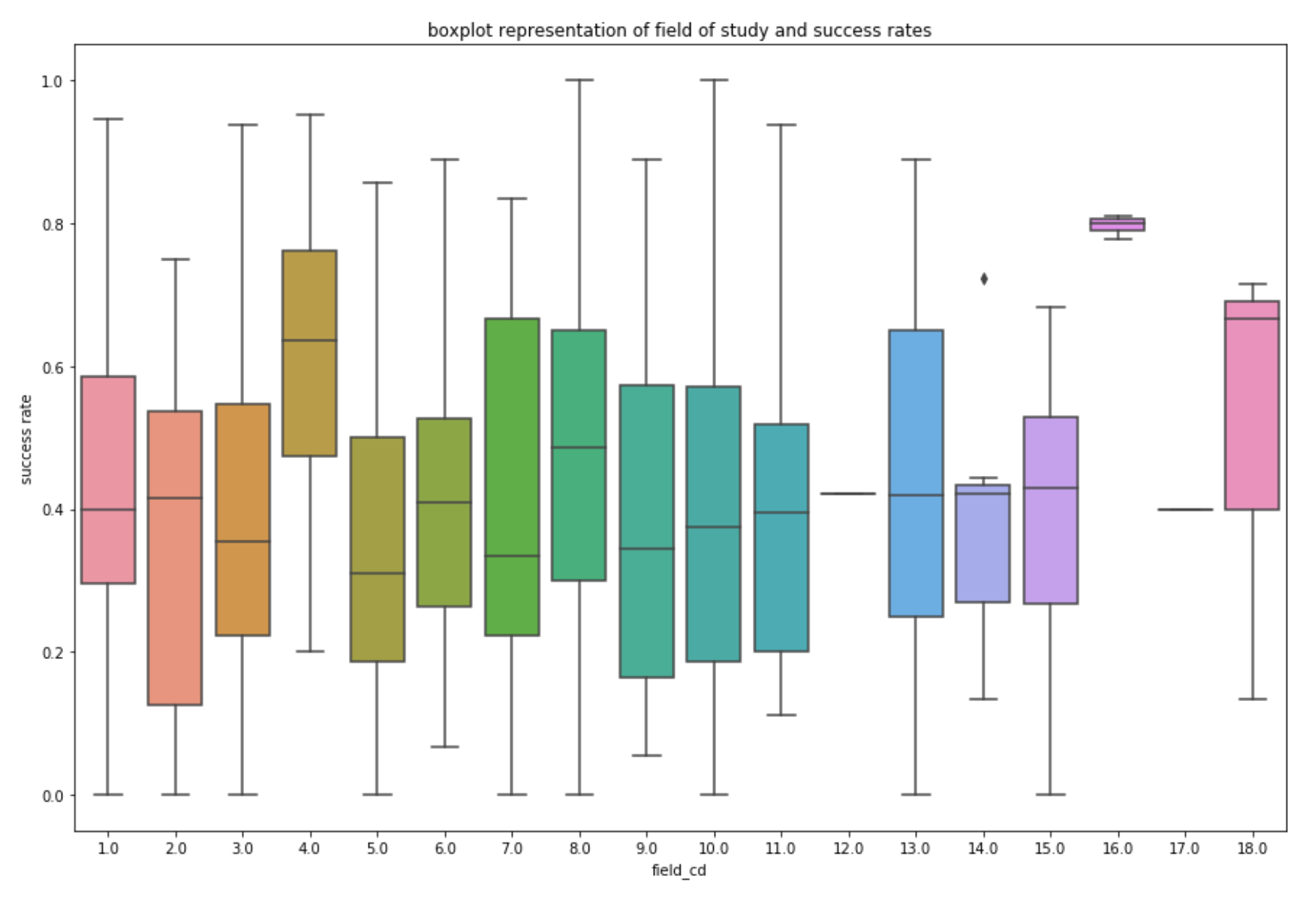




Success Rate by Profession

In [33]:
```
plt.figure(figsize=(15,10))
plt.title('boxplot representation of field of study and success rates')
sns.boxplot(x="field_cd", y="success rate", data=df_psy)
```

Out[33]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff4e6faf310>



1= Law
2= Math
3= Social Science, Psychologist
4= Medical Science, Pharmaceuticals, and Bio Tech
5= Engineering
6= English/Creative Writing/ Journalism
7= History/Religion/Philosophy
8= Business/Econ/Finance
9= Education, Academia
10= Biological Sciences/Chemistry/Physics
11= Social Work
12= Undergrad/undecided
13=Political Science/International Affairs
14=Film
15=Fine Arts/Arts Administration
16=Languages
17=Architecture
18=Other

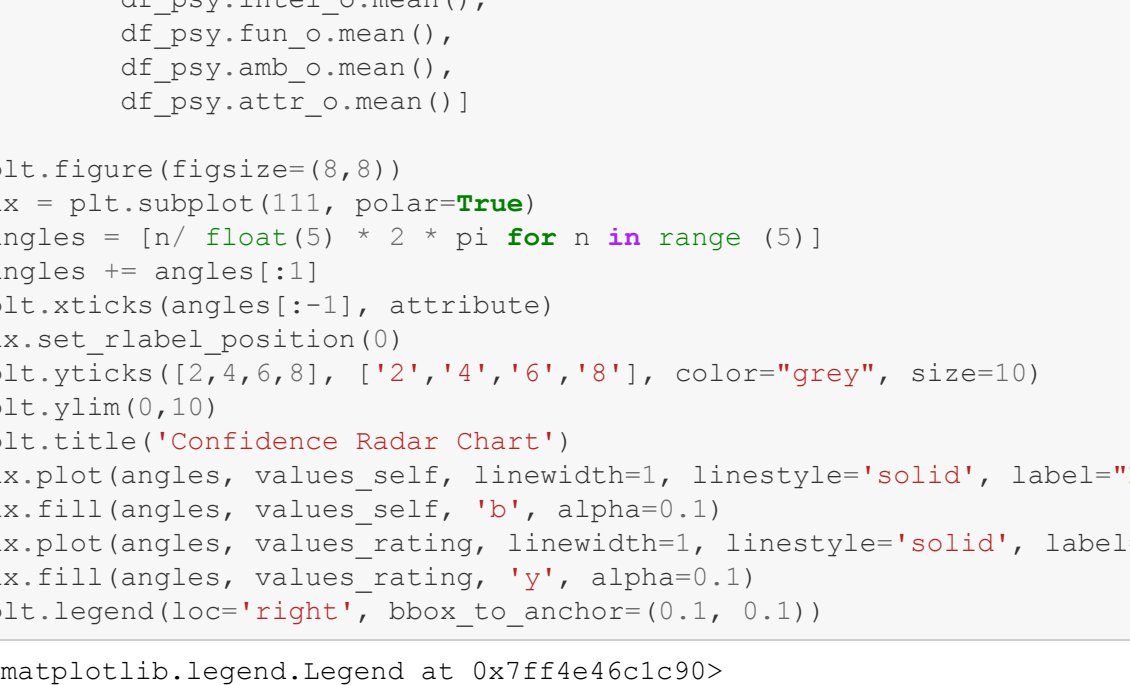
boxplot representation of success rate by field of study. #16 have low sample size so biased, #4 is languages.

Confidence Analysis

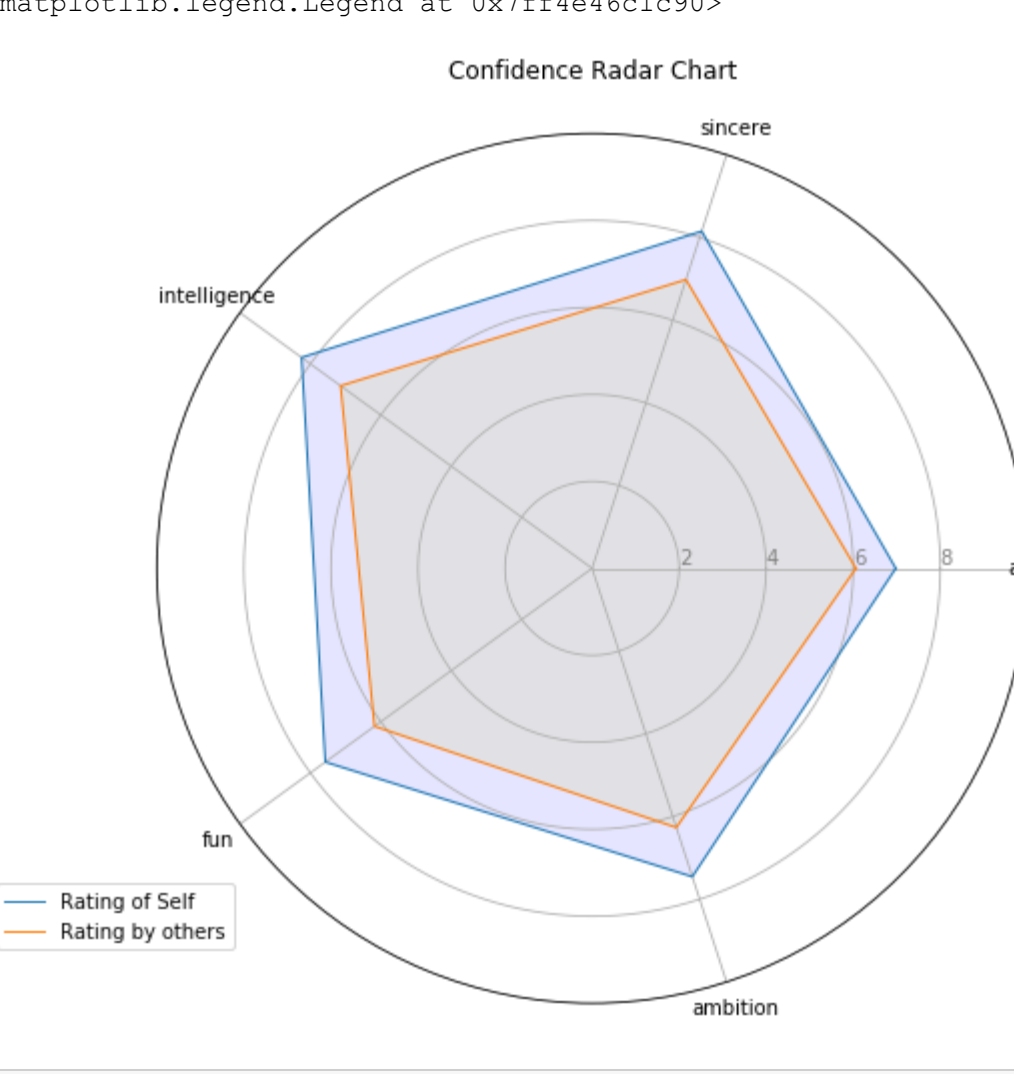
comparison between self rated attributes vs attribute average rated by partners

In [34]:
```
df_psy['attr3_1'] = df_full.groupby(['iid']).attr3_1.sum() / df_psy['# of dates']
df_psy['sinc3_1'] = df_full.groupby(['iid']).sinc3_1.sum() / df_psy['# of dates']
df_psy['intel3_1'] = df_full.groupby(['iid']).intel3_1.sum() / df_psy['# of dates']
df_psy['fun3_1'] = df_full.groupby(['iid']).fun3_1.sum() / df_psy['# of dates']
df_psy['amb3_1'] = df_full.groupby(['iid']).amb3_1.sum() / df_psy['# of dates']

df_psy['rating self'] = (df_psy['attr3_1'] + df_psy['sinc3_1'] + df_psy['intel3_1'] + df_psy['fun3_1']
+
                        df_psy['amb3_1']) / 5
```

```
In [35]: values_self=[df_psy.attr3_1.mean(),
                 df_psy.sinc3_1.mean(),
                 df_psy.intel3_1.mean(),
                 df_psy.fun3_1.mean(),
                 df_psy.amb3_1.mean(),
                 df_psy.attr3_1.mean()]

         values_rating=[df_psy.attr_o.mean(),
                 df_psy.sinc_o.mean(),
                 df_psy.intel_o.mean(),
                 df_psy.fun_o.mean(),
                 df_psy.amb_o.mean(),
                 df_psy.attr_o.mean()]

         plt.figure(figsize=(8,8))
         ax = plt.subplot(111, polar=True)
         angles = [n/ float(5) * 2 * pi for n in range (5)]
         angles += angles[:1]
         plt.xticks(angles[:-1], attribute)
         ax.set_rlabel_position(0)
         plt.yticks([2,4,6,8], ['2','4','6','8'], color="grey", size=10)
         plt.ylim(0,10)
         plt.title('Confidence Radar Chart')
         ax.plot(angles, values_self, linewidth=1, linestyle='solid', label="Rating of Self")
         ax.fill(angles, values_self, 'b', alpha=0.1)
         ax.plot(angles, values_rating, linewidth=1, linestyle='solid', label="Rating by others")
         ax.fill(angles, values_rating, 'y', alpha=0.1)
         plt.legend(loc='right', bbox_to_anchor=(0.1, 0.1))

Out[35]: <matplotlib.legend.Legend at 0x7ff4e46c1c90>
```




```
In [36]: df_psy['rating avg'] = (df_psy['attr_o'] + df_psy['sinc_o'] + df_psy['intel_o'] + df_psy['fun_o'] + df_
         psy['amb_o']
                                 ) / 5

In [ ]:

In [37]: df_psy['confidence level'] = df_psy['rating self'] / df_psy['rating avg']

In [38]: sns.jointplot(x="success rate", y="confidence level", data=df_psy, color = 'g', kind="reg",stat_func=st
         at.pearsonr)

Out[38]: <seaborn.axisgrid.JointGrid at 0x7ff4e8ec9850>
```



Analysis on Pairing

```
In [42]: dftemp=df_full.dropna(subset=['int_corr','pid','age_o','age','race','race_o'])
         dftemp = dftemp[dftemp['int_corr']!=0].copy()

In [43]: dftemp.shape

Out[43]: (8074, 196)
```

Creating a primary key to show each date only once

```
In [44]: dftemp['pair_val'] = (dftemp['iid']*dftemp['pid']+dftemp['race']+dftemp['race_o']+
                              (dftemp['int_corr']*dftemp['int_corr'])+(dftemp['age']*dftemp['age_o']))

In [45]: dftemp=dftemp.sort_values(by=['pair_val','gender'])

In [46]: dftemp.pivot_table(index=['pair_val'],aggfunc = 'size').max()

Out[46]: 4

In [47]: dftemp.pivot_table(index=['pair_val'],aggfunc = 'size').min()

Out[47]: 2

In [48]: dftemp.groupby('pair_val').filter(lambda x : len(x)>2)[['iid','pid','pair_val','gender']]

Out[48]:
```

	iid	pid	pair_val	gender
55	6	16.0	677.0361	0
60	7	11.0	677.0361	0
106	11	7.0	677.0361	1
155	16	6.0	677.0361	1
387	32	51.0	2259.1681	0
...	...	...	...	...
724	51	32.0	2259.1681	1
1981	147	163.0	24643.2601	0
2056	152	158.0	24643.2601	0
2162	158	152.0	24643.2601	1
2237	163	147.0	24643.2601	1

12 rows × 4 columns

```
In [49]: dftemp.groupby('pair_val').filter(lambda x : len(x)<3)[['iid','pid','pair_val','gender']]

Out[49]:
```

	iid	pid	pair_val	gender
1	1	12.0	480.2916	0
110	12	1.0	480.2916	1
2	1	13.0	483.0256	0
120	13	1.0	483.0256	1
3	1	14.0	503.3721	0
...	...	...	...	...
8376	552	529.0	292564.3844	1
7892	530	551.0	292629.1024	0
8355	551	530.0	292629.1024	1
7893	530	552.0	293116.0001	0
8377	552	530.0	293116.0001	1

8062 rows × 4 columns

```
In [50]: dftemp = dftemp.groupby('pair_val').filter(lambda x : len(x)<3)

In [51]: dftemp=dftemp[['match','pair_val','int_corr','iid','pid','gender','attr_o','sinc_o','intel_o','fun_o',
         'amb_o','shar_o','age'
                        ,'race','dec_o','goal','date',
                       'go_out','attr1_1','sinc1_1','intel1_1','fun1_1','amb1_1','shar1_1']]

In [53]: left = dftemp[~dftemp.pair_val.duplicated(keep='first')]

In [54]: right = dftemp[~dftemp.pair_val.duplicated(keep='last')]

In [55]: left.shape

Out[55]: (4031, 24)

In [56]: right.shape

Out[56]: (4031, 24)

In [57]: left['iid'].sum()

Out[57]: 1114310

In [58]: right['pid'].sum()

Out[58]: 1114310.0

In [61]: left['gender'].max()

Out[61]: 0

In [62]: right['gender'].max()

Out[62]: 1

In [63]: right = right.rename(columns={'iid':'iidM','attr_o':'attr_o2','sinc_o':'sinc_o2','intel_o':'intel_o2'
                                     ,'fun_o':'fun_o2','amb_o':'amb_o2'
                             ,'shar_o':'shar_o2'
                             ,'age':'ageM','race':'raceM','dec_o':'dec_o2','goal':'goalM'
                             ,'date':'dateM', 'go_out':'go_outM'
                             ,'attr1_1':'attr1_1M','sinc1_1':'sinc1_1M','intel1_1':'intel1_1M','fun1_1':'fun1_
         1M',
                             'amb1_1':'amb1_1M','shar1_1':'shar1_1M'})

In [64]: rightdf = right[['pair_val','iidM','attr_o2','sinc_o2','intel_o2','fun_o2','amb_o2','shar_o2','ageM'
                          ,'raceM','dec_o2','goalM','dateM',
                       'go_outM','attr1_1M','sinc1_1M','intel1_1M','fun1_1M','amb1_1M','shar1_1M']]

In [ ]:

In [65]: leftdf = left[['match','pair_val','int_corr','iid','attr_o','sinc_o','intel_o','fun_o','amb_o','shar_o'
         ,'age'
                        ,'race','dec_o','goal','date',
                       'go_out','attr1_1','sinc1_1','intel1_1','fun1_1','amb1_1','shar1_1']]

In [66]: dfml = leftdf.merge(rightdf,on =  'pair_val',how='left')

In [ ]:

In [67]: dfml.shape

Out[67]: (4031, 41)
```

Percantage of dates that Matched

```
In [68]: dfml.match.sum() / 4031 #looking for % match

Out[68]: 0.16497147109898289
```

Percentage of dates where women are rejected

```
In [69]: ( len(dfml[(dfml['dec_o']==0) & (dfml['dec_o2']==1)]) ) / 4031   # rejected girls

Out[69]: 0.20267923592160755
```

Percentage of dates where men are rejected

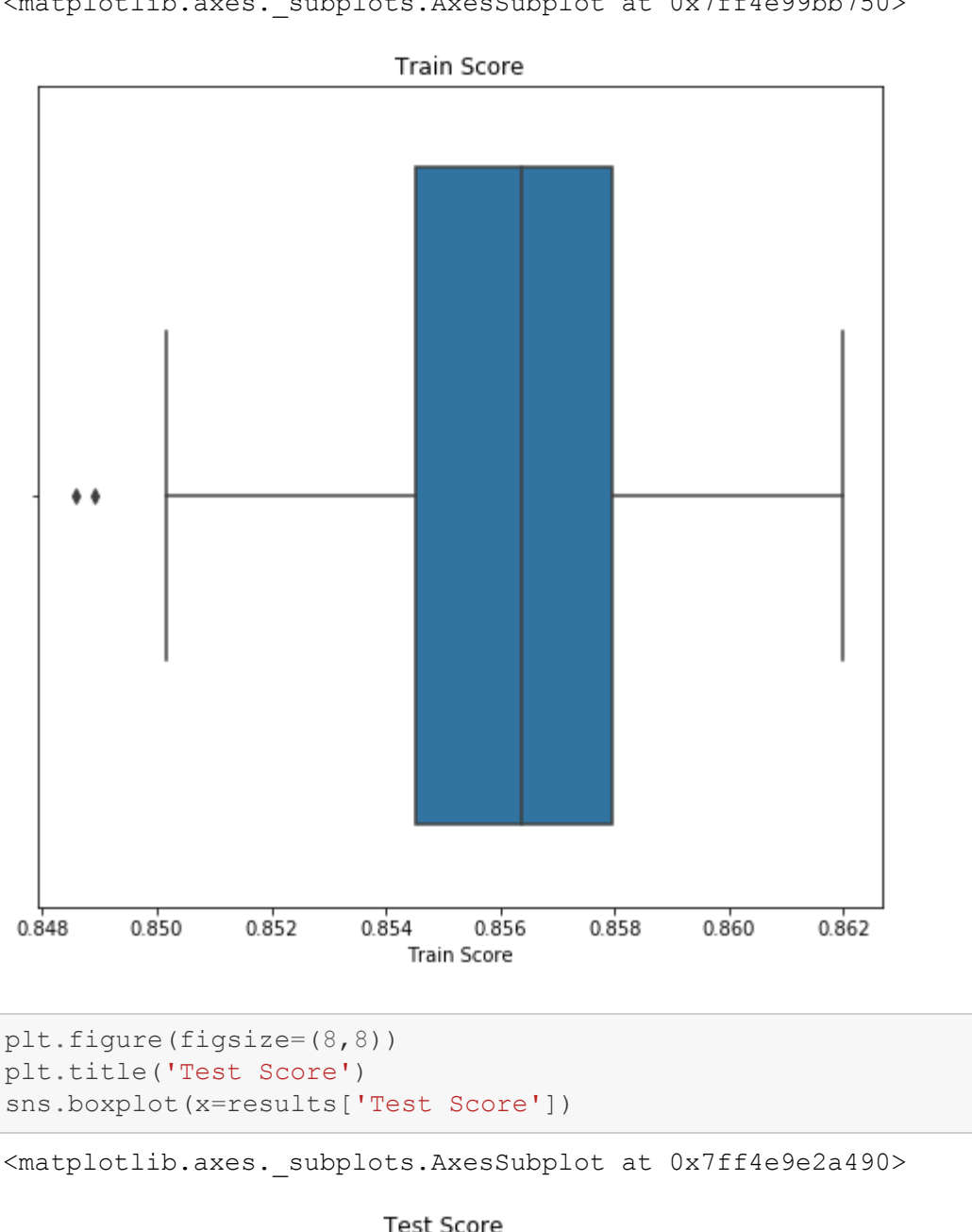
```
In [70]: ( len(dfml[(dfml['dec_o']==1) & (dfml['dec_o2']==0)]) ) / 4031   #guys

Out[70]: 0.30960059538576035
```

Percentage of dates where both gender have no interest

```
In [71]: ( len(dfml[(dfml['dec_o']==0) & (dfml['dec_o2']==0)]) ) / 4031  #no interest from both sides

Out[71]: 0.3227486975936492
```

Perdiction on Match Using Logistic Regression

```
In [76]: dfml = dfml.dropna(subset = ['dateM']).copy()

In [77]: dfml = dfml.fillna(dfml.mean())

In [78]: y = dfml['match']

In [79]: X = dfml.drop(columns=['match', 'dec_o','dec_o2','pair_val'])

In [80]: Xtrain, Xtest, ytrain, ytest = train_test_split(X,y,test_size = 0.2)
         clf = LogisticRegression(random_state=0)
         model = clf.fit(X,y)
         pred_train = model.predict(Xtrain)
         pred_test = model.predict(Xtest)

In [81]: accuracy_score(ytrain, pred_train)

Out[81]: 0.8526479750778816

In [82]: accuracy_score(ytest, pred_test)

Out[82]: 0.8729763387297634

In [83]: clf = LogisticRegression(random_state=0)

In [84]: results = pd.DataFrame(columns = ['Train Score', 'Test Score'])

In [85]: for i in range(100):
             Xtrain, Xtest, ytrain, ytest = train_test_split(X,y,test_size = 0.2,random_state=i)
             model = clf.fit(X,y)
             pred_train = model.predict(Xtrain)
             pred_test = model.predict(Xtest)
             results = results.append({'Train Score' : accuracy_score(ytrain, pred_train),
                                       'Test Score' : accuracy_score(ytest, pred_test)}, ignore_index = True)

In [86]: plt.figure(figsize=(8,8))
         plt.title('Train Score')
         sns.boxplot(x=results['Train Score'])

Out[86]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff4e99bb750>
```




```
In [87]: plt.figure(figsize=(8,8))
         plt.title('Test Score')
         sns.boxplot(x=results['Test Score'])

Out[87]: <matplotlib.axes._subplots.AxesSubplot at 0x7ff4e9e2a490>
```