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Report writing

M.Sc. Statistics (SEM-II)

Abstract:

A study was conducted which aimed to determine whether face attractiveness and gender significantly affect sentencing. Randomly we selected sample of individual responses by showing them images of suspects and collecting data by using questionnaire. The two way analysis was performed. The scores which were obtained taken as dependent variable and remaining gender & face were taken as factors. After analysis it was concluded that effect due to face and gender on score is significant with no interaction between face and gender.

Introduction:

The SPSS® software platform offers advanced statistical analysis, a vast library of machine learning algorithms, text analysis, open-source extensibility, integration with big data and seamless deployment into applications.
Its ease of use, flexibility and scalability make SPSS accessible to users of all skill levels. What's more, its suitable for projects of all sizes and levels of complexity, and can help you and your organization find new opportunities, improve efficiency and minimize risk.
Within the SPSS software family of products, SPSS Statistics supports a top-down, hypothesis testing approach to your data while SPSS Modeler exposes patterns and models hidden in data through a bottom-up, hypothesis generation approach.

Given data of males and females which are attractive as well as unattractive contains 82 responses on 8 questions collected in ordinal scale. These questions are asked to check sentencing about the given person is guilty or not is related to face attractiveness and gender. For the given analysis two-way analysis of variance was performed.

ANOVA (Analysis of Variance) is a statistical test used to analyse the difference between the means of more than two groups. In statistics, the two-way analysis of variance (ANOVA) is an extension of the one-way ANOVA that examines the influence of two different categorical independent variables on one continuous dependent variable. The two-way ANOVA not only aims at assessing the main effect of each independent variable but also if there is any interaction between them.

Objective:

To study the effect of face attractiveness and gender on sentencing i.e., whether the given person committed crime or not.

Literature review:

- Sarah Best who is a passionate full-time Head of Sociology and Psychology and has worked in a variety in schools in the UK published a blog on statistics of gender & crime in which she had explained men are much more likely to commit crimes than women. When trying to explain crime statistics showing that men commit many more criminal acts than women, some sociologists suggest that these statistics do not reflect reality. Rather mostly male law enforcement officers tend to attempt to protect women from the criminal justice system out of gentlemanliness. This is known as the chivalry thesis. While this seems a rather fanciful theory on the individual level (it's hard to imagine a police officer letting someone off a significant crime simply because they were a woman) there is a broader point about social expectations. Another consequence of men's "chivalric" values is that they might think women incapable of committing many crimes (temperamentally or physically) and therefore not seriously consider their guilt. In terms of punishment, judges and magistrates (again predominantly male) may take pleas for mitigation more seriously.
- A study was conducted by Alex Hodgkiss and Claire Handy, Department of Psychology, University of Warwick on The Criminal Face Effect: Physical Attractiveness and Character Integrity as Determinants of perceived criminality in which 2x3 factorial ANOVA was performed by taking severity of crime as dependent variable and attractiveness and character as factors. It was concluded that attractiveness and character do independently and significantly affect perceived criminality and interaction was not significant.
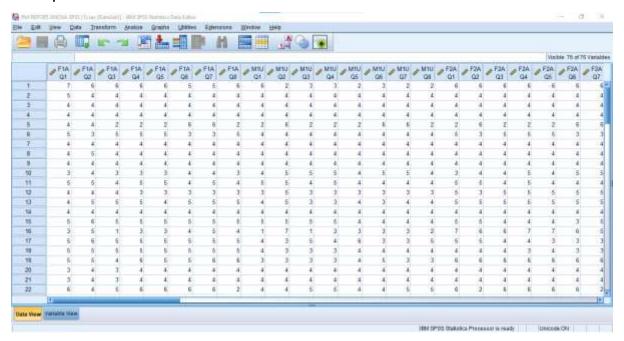
Data & Method:

The data consist of total 82 responses collected on 8 questions on 4 men and 4 women from which 2 men and 2 women were having attractive faces and remaining 2 men and 2 women were having unattractive faces. The questions which were asked by investigator are given below in fig 1.

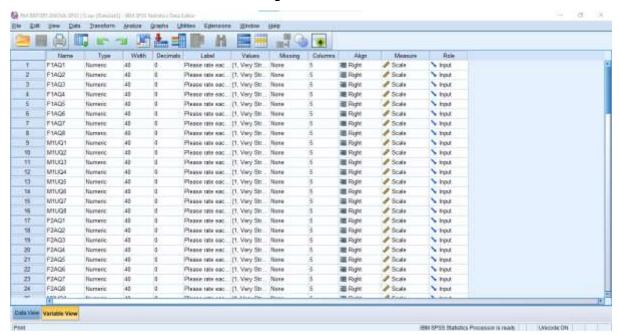Please rate each statement below; to indicate the extent to which you agree or disagree.

	Very Strongly Disagree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Very Strongly Agree
	○	○	○	○	○	○	○
I would believe what this person says	○	○	○	○	○	○	○
This person is not ethical	○	○	○	○	○	○	○
This person has integrity	○	○	○	○	○	○	○
I trust this person will tell me the truth	○	○	○	○	○	○	○
This person is honourable	○	○	○	○	○	○	○
This person is a liar	○	○	○	○	○	○	○
This person is not believable	○	○	○	○	○	○	○
This person is honest	○	○	○	○	○	○	○

(Fig. 1)

After collection of 82 responses from individuals, SPSS software was used to make further analysis. The collected data was imported to SPSS platform. The missing values were replaced by median as shown in fig. 4. Then it was recoded for Q2, Q6 & Q7 to make them in same orientation as shown fig 5.

The imported data is shown in below table:

(Fig. 2 Data view)

(Fig. 3 Variable view)
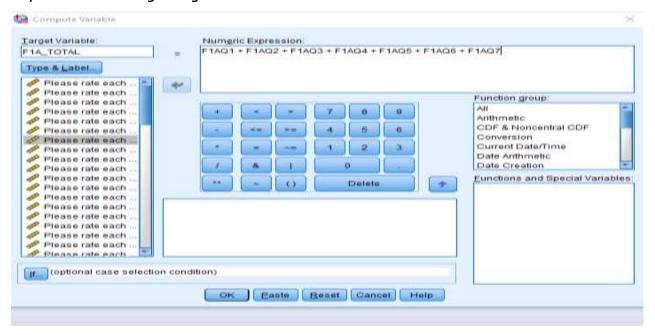
DATASET ACTIVATE DataSet1.
RMV /F1AQ1_1=MEDIAN(F1AQ1 ALL) /F1AQ2_1=MEDIAN(F1AQ2 ALL) /F1AQ3_1=MEDIAN(F1AQ3 ALL)
   /F1AQ4_1=MEDIAN(F1AQ4 ALL) /F1AQ5_1=MEDIAN(F1AQ5 ALL) /F1AQ6_1=MEDIAN(F1AQ6 ALL)
   /F1AQ7_1=MEDIAN(F1AQ7 ALL) /F1AQ8_1=MEDIAN(F1AQ8 ALL).
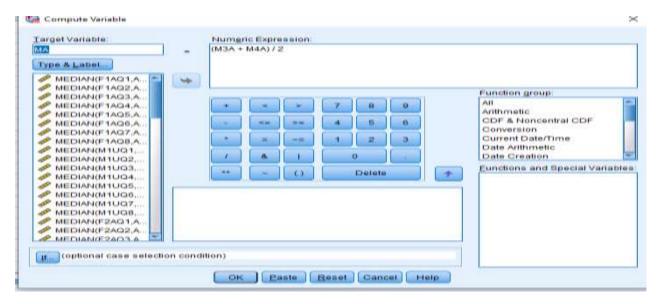
(Fig.4 replacing missing values by median)

(Fig.5 recoding Q2, Q6 & Q7)

Then new set variables were computed which contains the total scores of all 8 individuals for all 82 responses as shown in given fig 6.
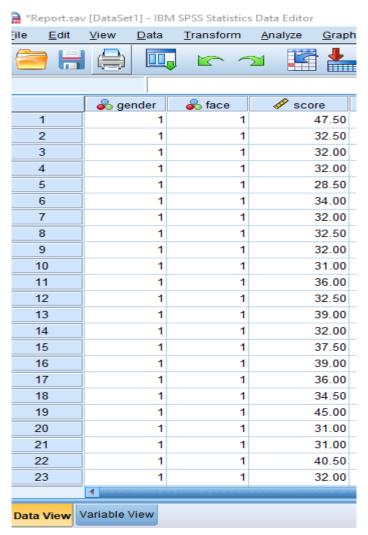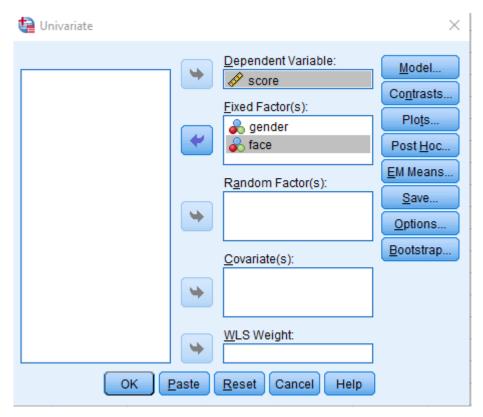

(Fig. 6 Total scores)

Then mean scores were calculated for attractive males, unattractive males, attractive females & unattractive females by using total scores as shown in fig 7.

(Fig.7 Mean scores)

(Fig.8 Two-way anova data)

(Fig.7 Two-way analysis)

These obtained scores were tabulated in three variables namely face, gender & score.

For face there were 2 categories i.e., attractive-1 and unattractive-2

For gender there were 2 categories i.e., male-1 and female-2

Two-way analysis was performed by taking score as dependent variable and face & gender as factors as shown in fig 7.

Results:

Following results were obtained from data

Descriptive of females (attractive & unattractive) and males (attractive & unattractive):

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
F1A	82	25.00	47.00	35.0122	4.55825	20.778
F2A	82	24.00	50.00	35.4268	4.58939	21.062
F3U	82	20.00	47.00	32.9146	5.24275	27.486
F4U	82	16.00	42.00	30.9024	4.43780	19.694
M1U	82	14.00	40.00	30.0976	4.44058	19.719
M2U	82	19.00	40.00	30.1707	4.38236	19.205
M3A	82	24.00	48.00	34.6585	3.92592	15.413
M4A	82	24.00	46.00	32.3659	4.04454	16.358
Valid N (listwise)	82					

(Table 1)

F1A= Female 1 with attractive face   M1U= Male 1 with unattractive face

F2A= Female 2 with attractive face   M2U= Male 2 with unattractive face

F3U= Female 3 with unattractive face   M3A= Male 3 with attractive face

F4U= Female 4 with unattractive face   M4A= Male 4 with attractive face

Descriptive of mean scores:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
FA	82	24.50	47.50	35.2195	3.74998	14.062
MU	82	22.50	40.00	30.1341	3.67428	13.500
FU	82	20.50	44.50	31.9085	3.97455	15.797
MA	82	27.00	47.00	33.5122	3.08719	9.531
Valid N (listwise)	82					

(Table 2)

FA= Female attractive mean score   MU= Male unattractive mean score

FU= Female unattractive mean score   MA= Male attractive mean score

Gender wise descriptive:

gender = female

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
score	164	20.50	47.50	33.5640	4.19471
Valid N (listwise)	164				

a. gender = female

(Table 3)

gender = male

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
score	164	22.50	47.00	31.8232	3.78354
Valid N (listwise)	164				

a. gender = male

(Table 4)

Face wise descriptive:

face = attractive

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
score	164	24.50	47.50	34.3659	3.52950
Valid N (listwise)	164				

a. face = attractive

(Table 5)

face = unattractive

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
score	164	20.50	44.50	31.0213	3.91801
Valid N (listwise)	164				

a. face = unattractive

(Table 6)

Two-way anova:

Tests of Between-Subjects Effects

Dependent Variable: score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1165.832[a]	3	388.611	29.390	.000
Intercept	350589.793	1	350589.793	26514.421	.000
gender	248.507	1	248.507	18.794	.000
face	917.232	1	917.232	69.368	.000
gender * face	.092	1	.092	.007	.933
Error	4284.125	324	13.223		
Total	356039.750	328			
Corrected Total	5449.957	327			

a. R Squared = .214 (Adjusted R Squared = .207)

(Table 7)

Interaction effect graph:

Conclusion:

According to table 7 there is a significant effect due to face and gender on score and there is no interaction effect of gender and face on score.

From graph of interaction, we can conclude that there is no interaction between face and gender.

So, gender and face attractiveness influence sentencings i.e., whether the given person committed crime or not.