Morgan BLEIN: SPSS Project

Marketing Research

Lily's Café case

A local restaurant chain, Lily's Café, has experienced consistent growth over the past few years. The restaurant management considers opening a new upscale restaurant in a new location. In order to understand the market potential and consumer preference in the local market, the management conducted marketing research.

SPSS dataset (LilyCafe.sav): https://drive.google.com/open?id=0B-8hHtq5SUaqWlhweUxYcG1Ecm8

My task as a marketing research consultant is to use the SPSS dataset, perform the proper analysis, and interpret the findings for each of the following questions specified by the management.

Methodology:

1. **State the research question.**
2. **State the statistical hypothesis**
3. **Set decision rule.**
4. **Conduct Statistical Analysis**
5. **Decide if result is significant.**
6. **Interpret result as it relates to your research question.**
7. **Provide managerial recommendations based on the result**

I. The management wonders if the restaurant is more appealing to women that it is to men or vice versa. The question concerns two groups: men and women. The "appealing" variable is a five-point rating scale asking the question "how likely would it be for you to patronize this restaurant."

1. **State the research question.**

   The management wonders if the restaurant is more appealing to women that it is to men or vice versa.

2. **State the statistical hypothesis**.

To answer the question, we have to use an Independent Samples t-test since the two groups are different, males vs. females

Null hypothesis: There is no difference in the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant." Between the group men and the group female.
Alternative hypothesis: There is a difference in in the "appealing" variable between the group male and the group female.

The question "how likely would it be for you to patronize this restaurant" is measured using the 5 point scale such as:
1 = "very unlikely"
2= "Somewhat unlikely"
3= "Neither likely nor unlikely"
4= "Somewhat likely"
5= "very likely"

3. **Set decision rule.**

We check the probability p in order to reject or fail to reject the Null hypothesis.

W We will reject the **Null hypothesis** if $p <= 0.05$

4. **Conduct Statistical Analysis (provide SPSS output)**

The Independent Samples t-test using "how likely would it be for you to patronize this restaurant." As test variable and gender as grouping variable returns:

Group Statistics

	What is your gender?	N	Mean	Std. Deviation	Std. Error Mean
How likely would it be for you to patronize this restaurant (new upscale restaurant)?	Male	176	2.71	1.070	.081
	Female	224	3.11	1.212	.081

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
How likely would it be for you to patronize this restaurant (new upscale restaurant)?	Equal variances assumed	1.643	.201	-3.422	398	.001	-.397	.116	-.625	-.169
	Equal variances not assumed			-3.474	392.597	.001	-.397	.114	-.622	-.172

5. **Decide if result is significant.**

The means are different (2.71 versus 3.11), and the p-value is .001 so p < =0.05. Therefore, we rejected the null hypothesis that there is no difference in the likelihood of patronizing the new restaurant between males and females.

6. **Interpret result as it relates to your research question.**

On a scale of 1 to 5, 5 being "very likely" 3.11> 2.71

The interpretation is that the likelihood for patronizing this restaurant is higher with females then males.

7. **Provide managerial recommendations based on the result**

For the group female, not only was the sample larger (224 > 176) but as stated previously, the likelihood for patronizing this restaurant is higher with females then males. Though the

difference in means is pretty small: 3.11-2.71=0.4 (on a 5 point scale) it is still enough to justify tending to the female groups with more attention.

II. The management of the restaurant wonders if a waterfront viewer is preferred more than a drive less than 30 minutes. Here, two questions need to be compared. Both are measured with a five-point Likert disagree-agree scale

1. State the research question.

The management of the restaurant wonders if a waterfront viewer is preferred more than a drive less than 30 minutes

2. **State the statistical hypothesis**.

To answer the question, we have to use a Paired-samples t-test since the two groups are from the same sample.

Both questions are measured using the same 5 point scale such as:
1 = "very strongly not prefer"
2= "Somewhat not prefer"
3= "Neither prefer nor not prefer"
4= "Somewhat prefer"
5= "very strongly prefer"

Null hypothesis: There is no difference in the preference between the 2 questions:
Prefer a drive less than 30 min
Prefer waterfront view.

Alternative hypothesis: There is a measurable difference in the preference between the 2 questions:

Prefer a drive less than 30 min
Prefer waterfront view.

3. Set decision rule.

We check the probability p in order to reject or fail to reject the Null hypothesis.

We will reject the **Null hypothesis** if $p <= 0.05$

4. Conduct Statistical Analysis (provide SPSS output)

The Paired-samples t-test using the 2 variables "Prefer a drive less than 30 min" and "Prefer waterfront view" returns:

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Prefer Waterfront View	3.96	400	1.102	.055
	Prefer Drive Less than 30 Minutes	2.37	400	1.049	.052

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Prefer Waterfront View & Prefer Drive Less than 30 Minutes	400	-.650	.000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Prefer Waterfront View - Prefer Drive Less than 30 Minutes	1.597	1.953	.098	1.406	1.789	16.358	399	.000

5. Decide if result is significant.

The means are different ("Prefer a drive less than 30 min": 2.37 versus "Prefer waterfront view": 3.96) and the p- value (sig 2 tailed) is .000. Therefore, we rejected the null hypothesis that there is no difference in consumer preference between a drive less than 30 min and a waterfront view.

6. Interpret result as it relates to your research question.

On a scale of 1 to 5, 5 being 5= "very strongly prefer" 3.96 > 2.37.

Therefore the interpretation is that the evaluation ratings for "Prefer waterfront view" are higher than those of "Prefer a drive less than 30 min".

7. **Provide managerial recommendations based on the result**

The difference between both evaluations is high: 3.96-2.37=1.59 (out of 5). It would seem this restaurant's potential clients are willing to drive for more than 30 min consistently. It is important to note that a waterfront view is very highly rated. I would personally recommend the restaurant owners to find a location very close to a body of water and put emphasis on the "water-side" dining experience, regardless of the amount of driving. A cumulated rating mean of almost 4/5 show the importance of this variable for potential customers.

III. <u>The management of the restaurant speculated that the different geographic areas that they identified by zip codes would have different reactions to the prospect of patronizing a new upscale restaurant. There are 4 zip code geographic areas (A, B, C, and D) identified. The prospect of patronizing a new upscale restaurant is a five-point rating scale asking the question "how likely would it be for you to patronize this restaurant."</u>

1. **State the research question.**

What is the likelihood of patronizing the new upscale restaurant for the different geographic areas (A, B, C, and D) identified?

2. **State the statistical hypothesis**.

To answer this question we have to use the ANOVA test, as we are testing for significant differences among more than two groups.

Null hypothesis: There is no difference in the likelihood of patronizing the new upscale restaurant depending on the different areas (A, B, C, and D)

The question "how likely would it be for you to patronize this restaurant" is measured using the 5 point scale such as:
1 = "very unlikely"
2= "Somewhat unlikely"
3= "Neither likely nor unlikely"
4= "Somewhat likely"
5= "very likely"

Alternative hypothesis: There is a measurable difference in the likelihood of patronizing the new upscale restaurant depending on the different areas (A, B, C, and D)

3. Set decision rule.

We check the probability p in order to reject or fail to reject the Null hypothesis.

We will reject the **Null hypothesis** if p < =0.05

4. Conduct Statistical Analysis (provide SPSS output)

The ANOVA and Duncan tests using the variable "how likely would it be for you to patronize this restaurant" as dependent list and the zip code area as factor returns:

ANOVA

How likely would it be for you to patronize this restaurant (new upscale restaurant)?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	325.124	3	108.375	196.816	.000
Within Groups	218.053	396	.551		
Total	543.178	399			

How likely would it be for you to patronize this restaurant (new upscale restaurant)?

Duncan

Please check the letter that includes the Zip Code in which you live (coded by letter).	N	Subset for alpha = 0.05		
		1	2	3
D (10, 11, & 12)	40	1.18		
A (1 & 2)	20	1.20		
C (6, 7, 8, & 9)	220		2.82	
B (3, 4, & 5)	120			4.01
Sig.		.872	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 45.517.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

5. **Decide if result is significant.**

The p- value for ANOVA test is .000. Therefore, we rejected the null hypothesis that there is no difference in the likelihood of patronizing the new restaurant between subgroups organized by zip codes of residence and grouped in 4 areas: A, B, C and D.

6. **Interpret result as it relates to your research question.**

Based upon the ANOVA result and Post Hoc Duncan's test, it appears that zip groups A and D have a small likelihood of patronizing the new restaurant (respectively 1.18 and 1.2, so between 1 = "very unlikely" and 2= "Somewhat unlikely")
Subset C with a mean of 2.82 is right around the middle of the scale (a little closer to 3= "Neither likely nor unlikely") so this subgroup seems to show limited but existing interest.
The subgroup showing the highest likelihood of patronizing this new restaurant is subgroup B with a mean of 4.01/5. (4= "Somewhat likely")

7. **Provide managerial recommendations based on the result**

From these results, it is clear that zip code groups of residence have a great impact on the likelihood of patronizing this new restaurant. As mentioned in part 6. Subgroup B shows the highest ratings by a long margin. (Second being C with 2.82) The difference between even group C and B is large: 4.01-2.82= 1.19: over a full point on a 5 point rating scale! I would recommend heavily focusing on this neighborhood in order to be more successful. That could happen many ways. For example management could advertise with billboards or mail mainly around this area, create partnerships with local commerce.

This however does not mean the restaurant needs to open in this specific neighborhood. As seen earlier, the variable "prefer a drive less than 30 min" seems to overall be of little concern for potential customers. As long as this stays true with customers within the area B, management can keep their options open in terms of location to focus on more important aspects (example: a location with a great waterfront)

In order to answer this question, we have to perform another ANOVA and Duncan tests. Methodology will be consistent with the previous test.

IV. **Extra**: Analyzing the variable: "prefer a drive less than 30 min" depending on the different areas (A, B, C, and D)

1. **State the research question.**

What is the preference for a drive less than 30 min to the new upscale restaurant for the different geographic areas (A, B, C, and D) identified?

2. **State the statistical hypothesis.**

Null hypothesis: There is no difference in the preference for a drive less than 30 min to the new upscale restaurant depending on the different areas (A, B, C, and D)

Alternative hypothesis: There is a measurable difference in the preference for a drive less than 30 min to new upscale restaurant depending on the different areas (A, B, C, and D)

3. **Set decision rule.**

We check the probability p in order to reject or fail to reject the Null hypothesis.

We will reject the **Null hypothesis** if p < =0.05

4. **Conduct Statistical Analysis (provide SPSS output)**

ANOVA

Prefer Drive Less than 30 Minutes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	138.587	3	46.196	60.953	.000
Within Groups	300.123	396	.758		
Total	438.710	399			

Prefer Drive Less than 30 Minutes

Duncan

Please check the letter that includes the Zip Code in which you live (coded by letter).	N	Subset for alpha = 0.05	
		1	2
C (6, 7, 8, & 9)	220	1.94	
A (1 & 2)	20	2.10	
D (10, 11, & 12)	40	2.15	
B (3, 4, & 5)	120		3.26
Sig.		.283	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 45.517.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

5. **Decide if result is significant.**

The p- value for ANOVA test is .000. Therefore, we rejected the null hypothesis that there is no difference in the preference for a drive less than 30 min to the new restaurant between subgroups organized by zip codes of residence and grouped in 4 areas: A, B, C and D.

6. **Interpret result as it relates to your research question.**

The question I raised is answered. Subset B's answer to the question: "Do you prefer a drive less than 30 min?" returns a mean of 3.26/5 therefore they closest answer to the question is 3= "Neither prefer nor not prefer"
It is still important to note that potential customers in the subset area B are the least willing for a long drive to the restaurant, while being the most likely to patronize.

7. **Provide managerial recommendations based on the result**

Based on these results, I can confirm that management should keep their options open in terms of location, as customers from area B: "Neither prefer nor not prefer" a drive less than 30 min. But I believe the area B could be a great place to think about opening a new restaurant, as long as other criteria's of importance such as "having a waterfront view" are met. The fact that customers in the subset area B are the least willing for a long drive to the restaurant is still important to note. In any event, they should still advertise heavily to customers from zip codes of residence under group B as they are much more likely to become patrons.

V. <u>The management of the restaurant wonders if an individual's demographic background (i.e., income, gender, marital status and education level) will influence one's likelihood to patronize the restaurant. Please perform the proper analysis, and interpret the findings as related to the managerial question.</u>

1. **State the research question.**

Management wonders if an individual's demographic background (i.e., income, gender, marital status and education level) will influence one's likelihood to patronize the restaurant.

2. **State the statistical hypothesis.**

To answer the question, we have to use Multiple Regression since we have multiple predictors: income, gender, marital status and education level

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$

With X_1: income

$X_{2:}$ gender

$X_{3:}$ marital status

$X_{4:}$ education level

Null hypothesis: There is no relationship between the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" and individuals demographic background
Alternative hypothesis: There is a relationship between the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" and individuals demographic background.

The question "how likely would it be for you to patronize this restaurant" is measured using the 5 point scale such as:

1 = "very unlikely"
2= "Somewhat unlikely"
3= "Neither likely nor unlikely"
4= "Somewhat likely"
5= "very likely"

3. Set decision rule.

We check the probability p in order to reject or fail to reject the Null hypothesis.

We will reject the **Null hypothesis** if p < =0.05

4. Conduct Statistical Analysis (provide SPSS output)

The Multiple Regression analysis, using the question "how likely would it be for you to patronize this restaurant" as dependent variable, and income, gender, marital status and education level as independent variables returns:

Descriptive Statistics

	Mean	Std. Deviation	N
How likely would it be for you to patronize this restaurant (new upscale restaurant)?	2.93	1.167	400

Recoded income to $1,000s using midpoints of questionnaire ranges	76.4688	53.13583	400
What is your gender?	1.56	.497	400
What is your marital status?	1.86	.547	400
What is your highest level of education?	5.78	1.414	400

Correlations

		How likely would it be for you to patronize this restaurant (new upscale restaurant)?	Recoded income to $1,000s using midpoints of questionnaire ranges	What is your gender?	What is your marital status?	What is your highest level of education?
Pearson Correlation	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	1.000	.747	.169	.043	.567
	Recoded income to $1,000s using midpoints of questionnaire ranges	.747	1.000	.161	.040	.491
	What is your gender?	.169	.161	1.000	.069	.042
	What is your marital status?	.043	.040	.069	1.000	.017
	What is your highest level of education?	.567	.491	.042	.017	1.000
Sig. (1-tailed)	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	.	.000	.000	.193	.000
	Recoded income to $1,000s using midpoints of questionnaire ranges	.000	.	.001	.213	.000
	What is your gender?	.000	.001	.	.085	.202

	What is your marital status?	.193	.213	.085	.	.364
	What is your highest level of education?	.000	.000	.202	.364	.
	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	400	400	400	400	400
	Recoded income to $1,000s using midpoints of questionnaire ranges	400	400	400	400	400
N	What is your gender?	400	400	400	400	400
	What is your marital status?	400	400	400	400	400
	What is your highest level of education?	400	400	400	400	400

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	What is your highest level of education?, What is your marital status?, What is your gender?, Recoded income to $1,000s using midpoints of questionnaire ranges[b]	.	Enter

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.784[a]	.615	.611	.728

a. Predictors: (Constant), What is your highest level of education?, What is your marital status?, What is your gender?, Recoded income to $1,000s using midpoints of questionnaire ranges

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	333.810	4	83.453	157.445	.000[b]
	Residual	209.367	395	.530		
	Total	543.178	399			

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

b. Predictors: (Constant), What is your highest level of education?, What is your marital status?, What is your gender?, Recoded income to $1,000s using midpoints of questionnaire ranges

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.385	.224		1.717	.087
	Recoded income to $1,000s using midpoints of questionnaire ranges	.013	.001	.607	16.685	.000
	What is your gender?	.140	.075	.060	1.878	.061
	What is your marital status?	.023	.067	.011	.337	.736
	What is your highest level of education?	.220	.030	.266	7.412	.000

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

5. **Decide if result is significant.**

The F test indicates that the regression model is significant at the 0.05 level (the p- value (sig in ANOVA table) is 000).
The R square for the model is 0.615 and the adjusted R squared is 0.611
Therefore, we rejected the null hypothesis that there is no difference in the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" based on an individual's demographic background.

6. **Interpret result as it relates to your research question.**

The coefficient of the income independent variable (p=0.00 and B = 0.013) and the education independent variable are significant (p=0.00 and B = 0.22)

However the coefficient of the gender independent variable (p=0.061 and B = 0.14) and the marital status independent variable (p=0.736 and B = 0.023) are not as significant as their p >=0.05.

Our equation:

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$

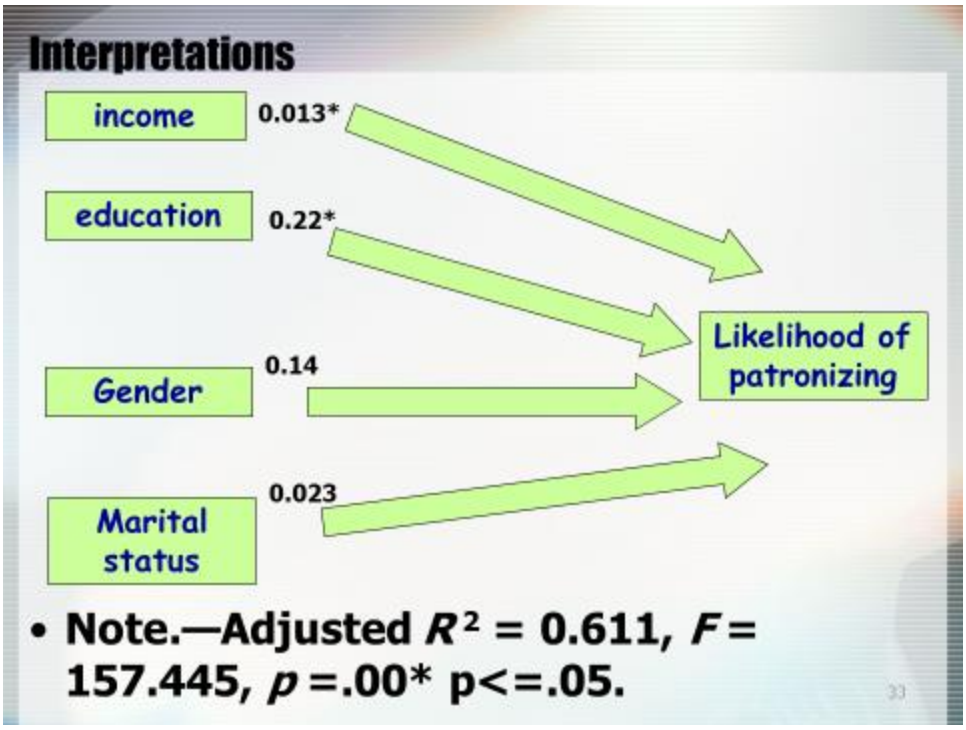
With X_1: income X_2: gender X_3: marital status and X_4: education level

Becomes:

$Y = 0.385 + 0.013X_1 + 0.22X_4$

Note: I did not list the non-significant variables in the equation.

Visual interpretation:



7. **Provide managerial recommendations based on the result**

The dependent variable: "how likely would it be for you to patronize this restaurant" is positively correlated to both the income and education level independent variables. The Education variable uses an 8 point scale system ranging from {1, Less than High School}...to {8, Doctorate Degree}. What this positive correlation means is the higher the education level, the more likely the customer would patronize the restaurant.
The income variable uses this scale:

1. Household Earning< $15,000
2. Household Earning $15,000-$24,999
3. Household Earning $25,000-$49,999
4. Household Earning $50,000-$74,999
5. Household Earning $75,000-$99,999
6. Household Earning $100,000-$149,999
7. Household Earning $150,000+

It is also mentioned that: "Recoded income to $1,000s using midpoints of questionnaire ranges"

It is also positively correlated to the likelihood of patronizing. Though the b value of 0.013 seem very slim, one has to keep in mind that income is recorded in thousands, so this apparently small ratio can have a big influence when normalized.

My personal recommendation would be for the restaurant to tend focus marketing efforts on potential clients with high incomes and level of education. That way, they will with no doubt rise their chances of finding patrons.

VI. The management of the restaurant would like to develop a richer profile of the most promising target market for the Lily's Café. They further identify both demographic and behavioristic variables in predicting one's likelihood to patronize the restaurant. These demographic and behavioristic variables include: expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born. Please perform the proper analysis, and interpret the findings as related to the managerial question.

1. State the research question.

Management wonders if an individual's demographic and behavioristic background (i.e., expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born) will influence one's likelihood to patronize the restaurant.

2. State the statistical hypothesis.

To answer the question, we have to use Multiple Regression since we have multiple predictors: expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born

$Y = a + b1X1 + b2X2 + b3X3 + e$

With X1: What would you expect an average evening meal entree item alone to be priced?

X2: Prefer Formal Waitstaff Wearing Tuxedos

X3: Year Born

Null hypothesis: There is no relationship between the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" and expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born.

Alternative hypothesis: There is a relationship between the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" and expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born.

The question "how likely would it be for you to patronize this restaurant" is measured using the 5 point scale such as:

1 = “very unlikely”

2= “Somewhat unlikely”

3= “Neither likely nor unlikely”

4= “Somewhat likely”

5= “very likely”

3. Set decision rule.

We check the probability p in order to reject or fail to reject the Null hypothesis.

We will reject the **Null hypothesis** if $p <= 0.05$

4. Conduct Statistical Analysis (provide SPSS output)

The Multiple Regression analysis, using the question “how likely would it be for you to patronize this restaurant” as dependent variable, and expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born as independent variables returns:

```
[DataSet1] C:\Users\morgan\Documents\CSU\fall2015\MKTG6401 market
research\SPSS2\LilyCafe.sav
```

Descriptive Statistics

	Mean	Std. Deviation	N
How likely would it be for you to patronize this restaurant (new upscale restaurant)?	3.24	.960	340
What would you expect an average evening meal entree item alone to be priced?	$20.7794	$10.58725	340
Prefer Formal Waitstaff Wearing Tuxedos	2.70	1.524	340
Year Born	1958.87	7.311	340

Correlations

		How likely would it be for you to patronize this restaurant (new upscale restaurant)?	What would you expect an average evening meal entree item alone to be priced?	Prefer Formal Waitstaff Wearing Tuxedos	Year Born
Pearson Correlation	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	1.000	.756	.689	-.668
	What would you expect an average evening meal entree item alone to be priced?	.756	1.000	.777	-.715
	Prefer Formal Waitstaff Wearing Tuxedos	.689	.777	1.000	-.800
	Year Born	-.668	-.715	-.800	1.000
Sig. (1-tailed)	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	.	.000	.000	.000
	What would you expect an average evening meal entree item alone to be priced?	.000	.	.000	.000
	Prefer Formal Waitstaff Wearing Tuxedos	.000	.000	.	.000
	Year Born	.000	.000	.000	.
N	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	340	340	340	340
	What would you expect an average evening meal entree item alone to be priced?	340	340	340	340
	Prefer Formal Waitstaff Wearing Tuxedos	340	340	340	340
	Year Born	340	340	340	340

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Year Born, What would you expect an average evening meal entree item alone to be priced?, Prefer Formal Waitstaff Wearing Tuxedos[b]	.	Enter

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.781[a]	.610	.607	.602

a. Predictors: (Constant), Year Born, What would you expect an average evening meal entree item alone to be priced?, Prefer Formal Waitstaff Wearing Tuxedos

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190.477	3	63.492	175.228	.000[b]
	Residual	121.746	336	.362		
	Total	312.224	339			

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

b. Predictors: (Constant), Year Born, What would you expect an average evening meal entree item alone to be priced?, Prefer Formal Waitstaff Wearing Tuxedos

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	51.128	15.152		3.374	.001
	What would you expect an average evening meal entree item alone to be priced?	.046	.005	.511	9.146	.000
	Prefer Formal Waitstaff Wearing Tuxedos	.088	.041	.139	2.145	.033
	Year Born	-.025	.008	-.191	-3.258	.001

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

5. Decide if result is significant.

The F test indicates that the regression model is significant at the 0.05 level (the p- value (sig in ANOVA table) is 000).

The R square for the model is 0.610 and the adjusted R squared is 0.607

Therefore, we rejected the null hypothesis that there is no difference in the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" based on expected average evening entrée price, preference for formal waitstaff with tuxedos, and year born.

6. Interpret result as it relates to your research question.

The coefficient of the "expected average evening entrée price" independent variable (p=0.00 and B = 0.046) is significant.

The coefficient of the "year born" independent variable (p=0.001 and B = -0.025) is significant.

The coefficient of the "preference for formal waitstaff with tuxedos," independent variable (p=0.033 and B = 0.088) is significant however close to the p limit of 0.05.

Our equation: $Y = a + b1X1 + b2X2 + b3X3 + e$

With X1: What would you expect an average evening meal entree item alone to be priced?

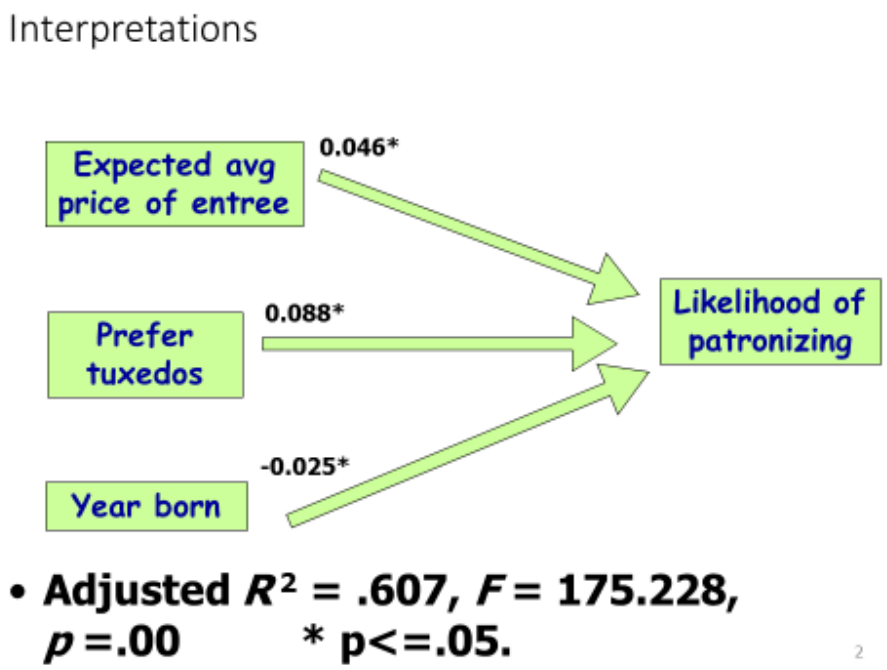
X2: Prefer Formal Waitstaff Wearing Tuxedos

X3: Year Born

Becomes:

Y = 51.128 + 0.046X1 +.088X2 + -0.025X3

Visual interpretation:



7. **Provide managerial recommendations based on the result**

The dependent variable: "how likely would it be for you to patronize this restaurant" seem to be positively correlated to both the expected average price of an evening entrée as well as the preference for the wait staff wearing tuxedos. Meaning the higher the price of an entrée and the higher the preference for the staff to wear tuxedos, the most likely the customer will become a patron.

This would tend to point out to a better-off crowd, where service and appearance is important and where price of an entrée item will be more expensive.

This is furthermore confirmed by the negative correlation between year born and likelihood of patronizing. Indeed since the coefficient is negative (-0.25) it means that the lower the year born, the most likely one is to patronize.

Let exemplify this concept:

Compare a 20 year old (year born= 1995) to a 60 year old (year born = 1955) likelihood of patronizing: if we take the equation (I voluntarily leave all the other variables and the constant out)

20 year old: Y = -0.025 * 1995= -49.875

60 year old: Y = -0.025 * 1955= -48.875

-49.875 < -48.875. Therefore a 20 year old will decrease the likelihood of patronizing more than a 60 year old.

As a whole, between the high entrée price, the desired formality of dress code for the wait staff and the inverse relationship between year born and likelihood of patronizing, management should focus on an older crowd. A younger crowd would be more sensitive to price and would not care much for formal wear.

This ties in with our first findings, where potential clients with high incomes and level of education should be marketed to. As a whole, an older crowd would tend to be more educated and have a higher income. This crowd should be the target of the management's marketing efforts.

VII. Extra analysis.

1. State the research question.

I wonder if an individual's preference for an elegant décor and a string quartet will influence one's likelihood to patronize the restaurant.

The purpose of this analysis is to help further pinpoint the potential clientele. We established that a sense of formality through tuxedos was appreciated. Thanks to this new analysis we can further confirm or deny this trend. Both those variables would point towards either an older crowd or maybe couples on an occasional romantic evening for a special occasion, for which they could spend more.

2. State the statistical hypothesis.

To answer the question, we have to use Multiple Regression since we have multiple predictors: preference for an elegant décor and preference for a string quartet

$Y = a + b1X1 + b2X2 + e$

With X1: preference for an elegant décor

X2: Pre preference for a string quartet

Null hypothesis: There is no relationship between the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" and preference for an elegant décor and preference for a string quartet

Alternative hypothesis: There is a relationship between the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" and preference for an elegant décor and preference for a string quartet

The question "how likely would it be for you to patronize this restaurant" is measured using the 5 point scale such as:

1 = "very unlikely"

2= "Somewhat unlikely"

3= "Neither likely nor unlikely"

4= "Somewhat likely"

5= "very likely"

3. Set decision rule.

We check the probability p in order to reject or fail to reject the Null hypothesis.

We will reject the **Null hypothesis** if $p <= 0.05$

4. Conduct Statistical Analysis (provide SPSS output)

The Multiple Regression analysis, using the question "how likely would it be for you to patronize this restaurant" as dependent variable, and preference for an elegant décor and preference for a string quartet as independent variables returns:

Descriptive Statistics

	Mean	Std. Deviation	N

How likely would it be for you to patronize this restaurant (new upscale restaurant)?	2.93	1.167	400
Prefer Elegant Decor	2.33	1.510	400
Prefer String Quartet	2.50	1.420	400

Correlations

		How likely would it be for you to patronize this restaurant (new upscale restaurant)?	Prefer Elegant Decor	Prefer String Quartet
Pearson Correlation	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	1.000	.702	.650
	Prefer Elegant Decor	.702	1.000	.843
	Prefer String Quartet	.650	.843	1.000
Sig. (1-tailed)	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	.	.000	.000
	Prefer Elegant Decor	.000	.	.000
	Prefer String Quartet	.000	.000	.
N	How likely would it be for you to patronize this restaurant (new upscale restaurant)?	400	400	400
	Prefer Elegant Decor	400	400	400
	Prefer String Quartet	400	400	400

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Prefer String Quartet, Prefer Elegant Decor[b]	.	Enter

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.711[a]	.505	.502	.823

a. Predictors: (Constant), Prefer String Quartet, Prefer Elegant Decor

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	274.261	2	137.130	202.444	.000[b]
	Residual	268.917	397	.677		
	Total	543.178	399			

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

b. Predictors: (Constant), Prefer String Quartet, Prefer Elegant Decor

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.561	.084		18.678	.000
	Prefer Elegant Decor	.412	.051	.534	8.128	.000
	Prefer String Quartet	.164	.054	.200	3.047	.002

a. Dependent Variable: How likely would it be for you to patronize this restaurant (new upscale restaurant)?

5. Decide if result is significant.

The F test indicates that the regression model is significant at the 0.05 level (the p- value (sig in ANOVA table) is 000).

The R square for the model is 0.505 and the adjusted R squared is 0.502

Therefore, we rejected the null hypothesis that there is no difference in the "appealing" variable asking the question: "how likely would it be for you to patronize this restaurant" based on preference for an elegant décor and preference for a string quartet.

6. **Interpret result as it relates to your research question.**

The coefficient of the "preference for an elegant décor" independent variable (p=0.00 and B = 0.412) is significant. The coefficient is really high too. Meaning customer would tend to care about this detail.

The coefficient of the "preference for a string quartet" independent variable (p=0.002 and B 0.164) is significant.

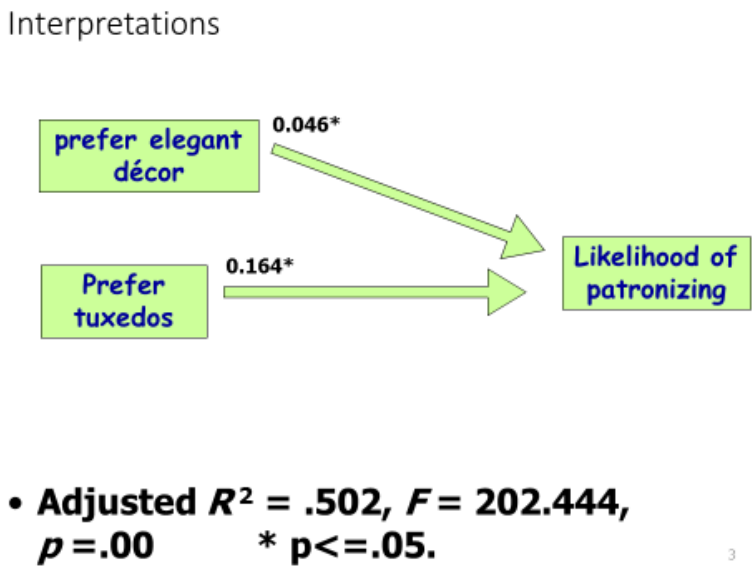
Our equation: Y = a + b1X1 +b2X2 + e

With X1: preference for an elegant décor

X2: preference for a string quartet

Becomes:

Y = 1.561+ 0.412X1 +0.164X2



7. **Provide managerial recommendations based on the result**

Both preference for an elegant décor and preference for a string quartet are positively correlated to the likelihood of patronizing the restaurant. These findings are consistence with the 2 previous analysis. Based on these facts, I would recommend the restaurant to keep a certain formal image.

Good quality music décor and atmosphere (part III, part II with tuxedos for the wait staff) will attract customers with high incomes and education (part I). They will not hesitate to pay more for their entrees and will usually be older.