## Project Report On

# "Impact Of Family Background On career choice of students"

## Submitted By

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Kondawa, Pune



## **DECLARATION**

We the undersigned solemnly declare the report of the project work in entitled "Impact of Family background on career choices of the students" is based on our own work carried out during the course of our study under the supervision of Dr.Nazia Wahid and prof. Aarti Hakim . We asset that the students made the conclusion drawn are an outcome of project work. We Further declare that to best of our knowledge and belief that the project report does not contain any part of any work which has been submitted for the of any other award Degree/Diploma/Certificate in this university or any other university.

#### Name of the students

#### **Signature**

- Miss.Jyoti Sutar
- Miss.Shubhangi Adak
- Miss.Nimisha Sambhare
- Mr.Prasanna Neve.

## VISHWAKARMA UNIVERSITY

Kondawa, Pune



## CERTIFICATE

This is to certify that the Project entitled "Impact Of Family Background On career choice of students" is successfully completed & Submitted by

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### M.ScII<sup>nd</sup> Year

This Project is Delivered in partial fulfillment of the award of the Degree of "Master Of Science" in Statistics During the academic year 2019-2021

HEAD OF THE DEPARTMENT

TECHER IN-CHARGE

EXTERNAL EXAMINER.

## **ACKNOWLEDGEMENT**

It gives us an immense pleasure in submitting the project report on the topic "Impact of family background in the career choices of students". We take this opportunity to express our gratitude to our guide **Dr.Nazia Wahid** who not only encouraged us but also were a constant source of Guidance throughout this project. We are thankful to all our friends who Directly and indirectly help us in completing in our project.

Finally, we are also thnankful to **Prof. Aarti Hakim** and course In-Charge **Dr.Nazia Wahid** for providing all the facilities who give necessary help from time as required.

## Thanking You!!!

Miss.Jyoti Sutar Miss.Nimisha Sambhare Miss.Shubhangi Adak Mr.Prasanna Neve

(M.Sc II<sup>nd</sup> Year)

#### Introduction

This project is under the topic "Impact of Family Background on Career Decision of Students". Motivation behind this project is that very often it happens with students that they make wrong choice of career. Wrong choice of career may lead to a lot of changes in future of students or career failure. This project is to study the factors of family background which affects to the career choice of student.

Proceeding to this study, the experience of university students who are doing their graduation/post-graduation has been recorded on several variables. The university students have already made their decision about career. So, the experience they had while making career choice can be used to study purpose. The questionnaire has been used to record student's response.

Using this data collected from university students, we examined how family background affects to the career choice of students

#### **Literature Review**

The background of family has been influential and important factor affecting the career choice of student. Bernard Mensah Amoako, James Divine Danyoh and Daniel K. Buku 2020 investigated some family background factors affects career decision of high school students in their research article "The impact of family background on career decisions of senior high school students: A case of Ghana". The factors are Socio-Economic level (SE), Educational level (EL), Career of Parent (CP), SelfEfficacy (SE) with SE had not significant effect on career decision students. But this finding contradicts to Creed et al. (2007), when they found that students with higher level of confidence in career decision-making were more likely to report higher incidences of career exploration than students with lower levels of self-efficacy. The researcher then reveals that this may due to culture of the study area that children are brought up to be seen but not heard with regards to issues of their development. However, there could be other factors present about family background like Family size, Career information and guidance from parents, Parent's expectation which may affect significantly on the career choice of students.

Government Area of EDO state. This study is restricted to secondary school in Esan Central Local Government Area of Edo State. In realization of similar conditions facing most students in other secondary schools in Edo State, the survey shall focus on students in their first year and the final year of studies. In this research, they have studied what is immediate and remote causes of the factors hindering high standard of education, while we blame the government, teachers, and children, the family which students come from leave much to be desired. Family background factors found to have an influence on the student's choice of career is based on parents' socio-economic status, parents' education, parents' occupation, parents' love for a child, parents' temperament.

#### **Aim and Objective**

Aim: To study the impact of family background on career choice of students.

#### **Objective:**

To examine whether the

- parent's income influences the career choice of students.
- education level of parents influences the career choice of students .
- size of family, number of siblings influences the career choice of students.
- self esteem of student affect their career choice
- effect of Temperament and ability, expectations, Occupation of parents influences the career choice of students.

#### Methodology

So, we have,

One dependent variable CDMI (Career Decision Making Scale)

Which has four different levels:

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

And 9 independent variables Family Size, Area, Parent's Education, Parent's Occupation, Family Income, Parent's Ability & Temperament, Career Guidance, Parent's Expectation, Self-esteem.

So, in order to analyze/interpret the data which has more than two different levels we will use **Ordinal Logistics Regression** or **Proportional Odds Logit Regression**.

Let the dependent variable has 4 levels and let we have  $\ \square$  number of independent variables.

The **Logit Model** is given by

$$\square(\square \leq \square) = \frac{1}{1 + \square^{-(\square\square - \sum \square\square \square)}}$$
Here,

•	The probability ( $\square \leq \square$ ) is conditional probability of at least y given
	x. That is $\Box(\Box < \Box \mid \Box_\Box)$

$$\bullet \quad \square_{\square} = \sum \square_{\square} \square_{\square} = \square_{1} \square_{1} + \square_{2} \square_{2} + \cdots \square_{\square} \square_{\square}$$

The **Odds model** is given by

$$\square_{\square} = \ln \square (\square \leq \square) = \square_{\square} - \sum \square_{\square} \square_{\square}$$

#### **Significance of variables:**

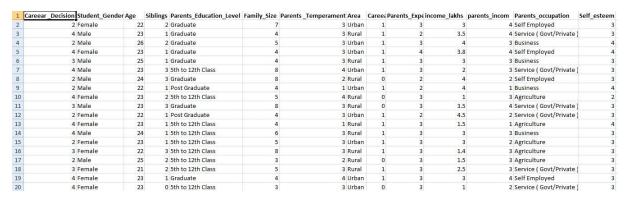
Let us set the hypothesis to check the significance of the independent variable.

$$\square_0$$
:  $\square_1 = \square_2 = \cdots \ldots = \square_\square = 0$ 

 $H_1$ : at least one  $\beta_j \neq 0$ .

#### **Data Description**

Below is a short preview of the dataset after some cleaning and wrangling.

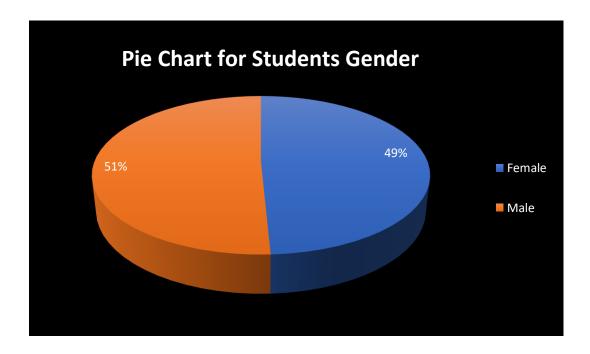


Only first 19 observations are shown, which contain 130 row and 14 columns (dimension of data 130x14)

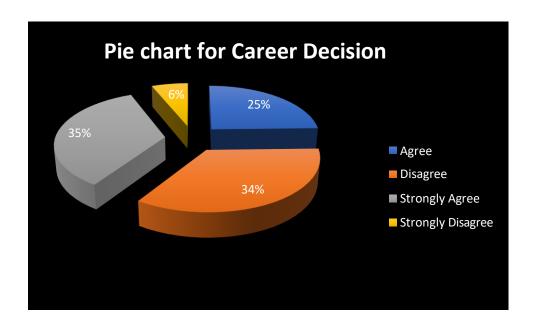
- 1. **Career\_decision**:It indicate the openion of student about influence of family background on there career decision.It is ordinal in nature and it will consider as a dependent variable for analysis.
- 2. **Student\_Gender**: Gender of Student Male or Female.
- 3. Age: Age of Student.
- 4. **Siblings**: Number of Siblings has a student.
- 5. Family Size: Total Family members of a Student.
- 6. **Parent Education Level**: Parents education Level(Illiterate or 5<sup>th</sup> to 12<sup>th</sup> or Graduate or Post Graduate).
- 7. **Area**: Area in which student is belongs (Rural or Urban).
- 8. **Income Lakh**: Family's annual income in Lakh.
- 9. **Career\_Information \_of\_ Parents**: It is related to ,any earlier Information to parents about career of Child(Yes=1,No=0).

10. Parent's Occupation: It indicate parents occupation of student. 11. Parents \_Temperament \_& \_Ability 12. parents\_incom 13.**Self esteem** 14.Parents expectations (11,12,13& 14 are the opinion of students about effect of Parents \_Temperament \_& \_Ability , parents\_incom, Parents expectations & Self esteem on their career choice decision.)

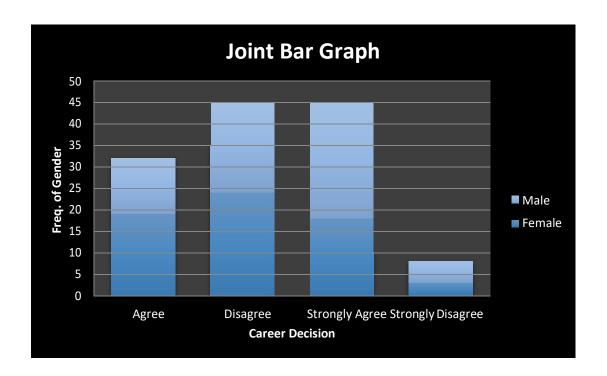
#### **Data Visualization**



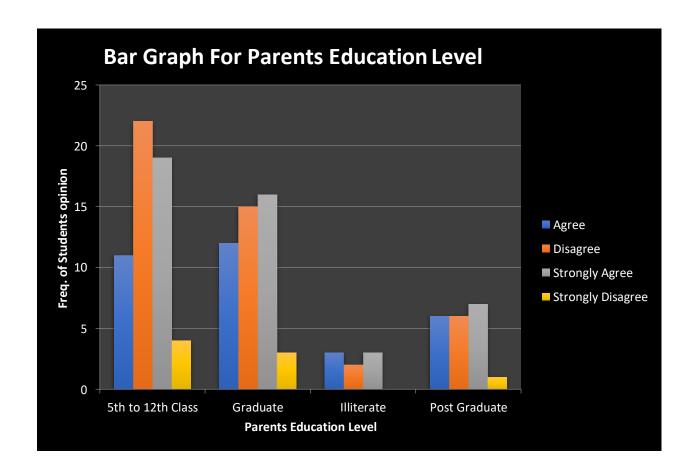
Conclusion: There are 49% Female and 51% Male students in the data.



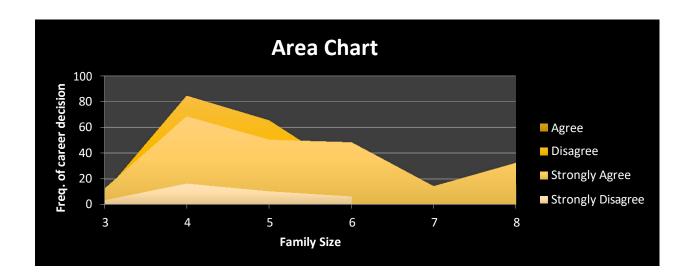
**Conclusion:** There are **35%** students who are **Strongly Agree** about career decision is depends on family background whereas **34% are Disagree**, **25% Agree** and **6% Strongly Disagree**.



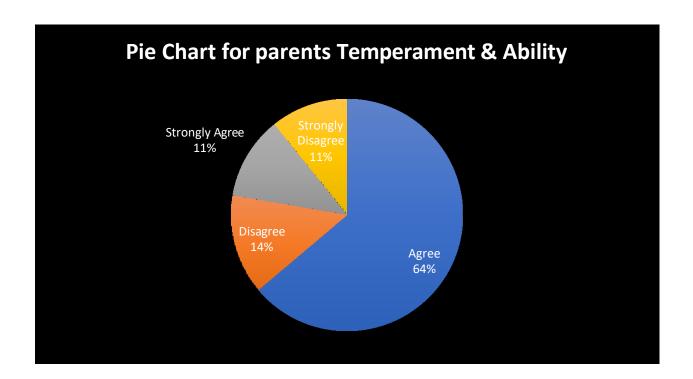
**Conclusion:** Mostly **Male** Students are strongly agree about effect of Students gender while choosing career whereas most of **Female** students Disagree.



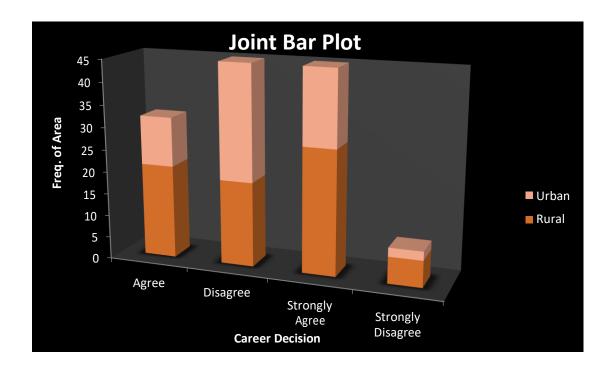
**Conclusion:** Students are almost **strongly agree** about effect of parents education level on their career choice . It means Parents education level may affect students career choice.



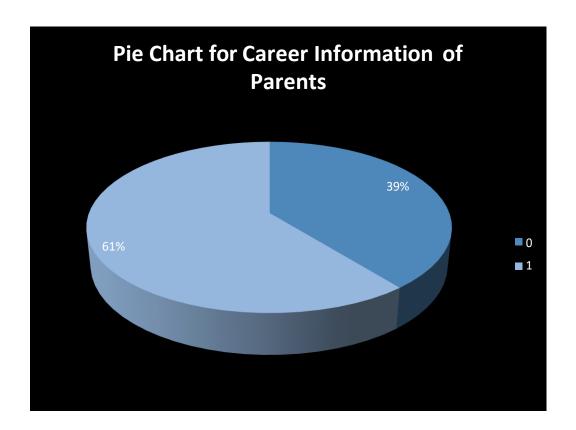
**Conclusion**: Major Area of family size 3 - 8 filled with **Strongly Agree and Agree** opinion of students about influence of family size on their career decision.



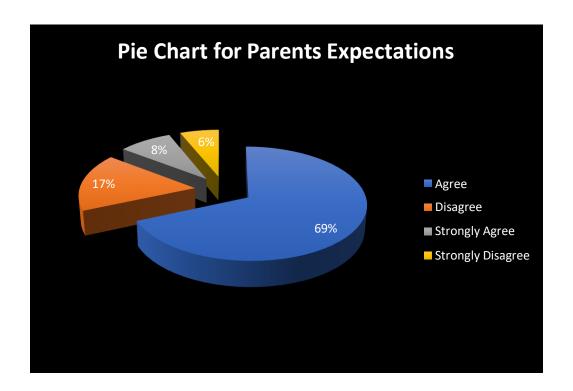
Conclusion: There are 64% students Agree and 11% students are strongly Agree about dependency of career decision on parents Temperament & Ability whereas 14% Disagree and only 11% are Strongly Disagree.



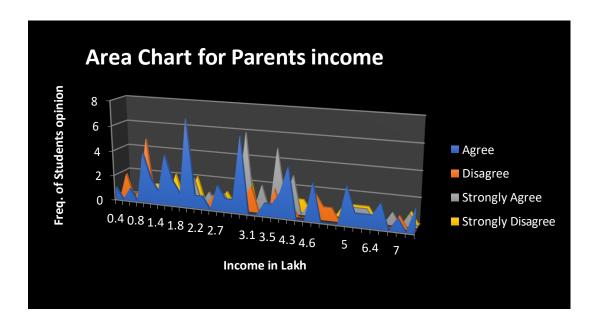
**Conclusion:** The students who are from **Rural area are mostly strongly Agree and Agree** about influence of area on their career decision as compare to students from Urban area.



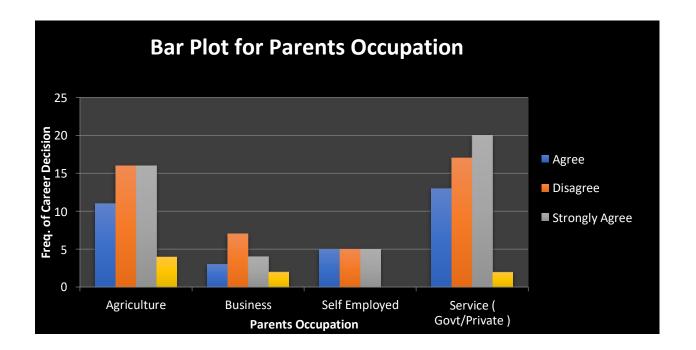
**Conclusion:** Here 61% students who got career information and guidance from their parents whereas 39% students don't.



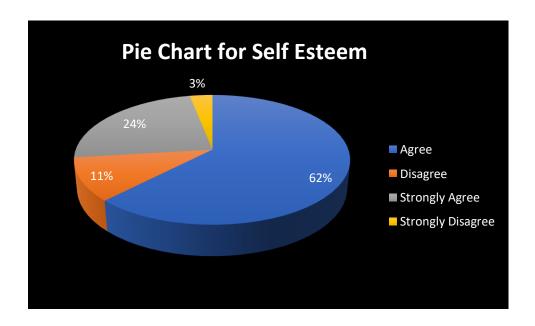
**Conclusion:** There are 69% + 8% = 78% students whose parents expectations and career choice matches .



**Conclusion:** The major area is filled with Agree and Strongly Agree opinion of students about positive impact of family income on career decision .



**Conclusion:** Most of students are **Strongly Agree as well as Disagree** at each filed of parents occupation about affect of Parents occupation on their career choice . i.e Parents occupation **may or may not be** affect the career choice of students.



**Conclusion:** Here ,**62% + 24% = 84%** students who are confident while making career decision.

#### Preliminary Analysis on the Dataset in R

#### attach(pdata)

#### colnames(pdata)

[1] "Careear \_Decision" 2"Student\_Gender"

[3] "Age" 4" Siblings" [5] "Parents\_Education\_Level" 6"Family\_Size"

[7] "Parents \_Temperament \_& \_Ability " 8"Area"

[9] "Careear\_Information \_of\_ Parents " 10"Parents\_Expectations"

#### Strcture of data

#### str(pdata)

tibble [130 x 14] (S3: tbl\_df/tbl/data.frame)

\$ Career \_ Decision : num [1:130] 2 4 2 4 3 4 2 2 4 3 \$ Student\_Gender : chr [1:130] "Female" "Male" "Male \$ Age : num [1:130] 22 23 26 23 25 23 24

\$ Siblings : num [1:130] 2 1 2 1 1 3 3 1 2 3

\$ Parents\_Education\_Level : chr [1:130] "Graduate" "Graduate" "Graduate"

\$ Family\_Size : num [1:130] 7 4 5 4 4 8 8 4 5 8

\$ Parents \_Temperament \_& \_Ability: num [1:130] 3 3 3 3 3 4 2 1 4 3 \$ Area : chr [1:130] "Urban" "Rural" "Urban" \$ Careear Information of Parents: num [1:130] 1 1 1 1 1 1 0 1 0 0

\$ Parents\_Expectations : num [1:130] 3 2 3 4 3 3 2 2 3 3 \$ income\_lakhs : num [1:130] 3 3.5 4 3.8 3 2 4 4 \$ parents\_incom : num [1:130] 4 4 3 4 3 3 2 1 3 4 \$ Parents occupation : chr [1:130] "Self Employed" "Servie

\$ Self esteem : num [1:130] 3 3 4 4 3 3 3 4 2 3

#### **Fitting of Ordinal Logistic Regression Model**

The reason for doing the analysis with Ordinal Logistic Regression is that the dependent variable is categorical and ordered. The dependent variable of the dataset is *Career Decision*, which has four ranked levels — *Strongly Disagree=1*, *Disagree=2*, *Agree=3*, *Strongly Agree=4*. Ordinal Logistic Regression takes account of this order and return the contribution information of each independent variable which are continues as well as ordered in nature.

One could fit a **Multinomial Logistic Regression model** for this dataset, however the Multinomial Logistic Regression does not preserve the ranking information in the dependent variable when returning the information on contribution of each independent variable.

Another method that comes in mind when talking about "most important variables" is the **Principal Component Analysis (PCA)**. However PCA doesn't take account of the response variable, it only consider the variance of the independent variables, so we won't be using it here as the result could be meaningless.

#### Hypothesis to be testing

Since the outcome variable is categorized and ranked, we can perform an Ordinal Logistic Regression analysis on the dataset. We set the alpha = 0.05 and the hypothesis as follows: **H0**: there is no statistically significant factors between the variables that influence the *career choice of Students*.

**H1**: there is at least one statistically significant factor between the variables that influence the *career choice of Students*.

Below is the R code for fitting the Ordinal Logistic Regression and get its coefficient table with p-values

##Conversion of Character variable into orderd

```
pdata$`Careear Decision`<-as.ordered(pdata$`Careear Decision`)
##partition of data
ind<-sample(2,nrow(pdata),replace = TRUE,prob=c(0.8,0.2))
train<-pdata[ind==1,]
test<-pdata[ind==2,]
##Ordinal logistic regression
library("MASS")
ma<-poir(`Careear _Decision`~ . -Age,train,Hess=TRUE)</pre>
polr (formula = `Careear _Decision` ~ -Age, data = train, Hess = TRUE)
No coefficients
Intercepts:
    Value
             Std. Error t value
 2 -2.6288
              0. 3914
2|\bar{3}| -0.5108
              0. 2025
   0. 5938
              0. 2048
```

#### summary(ma)

#### Call:

polr(formula = `Careear \_Decision` ~ . - Age, data = train, Hess = TRUE)

#### Coefficients:

Coefficients:	Value	C+d Error	+ volue
Ctlt OdWala	Value	Std. Error	t value
Student_GenderMale	0. 716578	0. 4662	1. 53700
Siblings	0. 250984	0. 2144	1. 17048
Parents_Education_LevelGraduate	-0. 087403	0. 5117	-0. 17081
Parents_Education_LevelIlliterate	0. 135330	0. 8035	0. 16842
Parents_Education_LevelPost Graduate	0. 180406	0. 7432	0. 24274
Family_Size	0. 304175	0. 1780	1. 70860
`Parents _Temperament _& _Ability`	0. 676633	0. 3267	2. 07114
AreaUrban	-0. 064483	0. 5084	-0. 12684
`Careear_Information _of_ Parents`	0. 464603	0. 4678	0. 99323
Parents_ExpectationsDisagree	0. 025375	0. 6818	0. 03722
Parents_ExpectationsStrongly Agree	0. 176052	0. 7774	0. 22645
Parents_ExpectationsStrongly Disagree	0. 343886	0. 8209	0. 41893
income_lakhs	-0. 006288	0. 1361	-0. 04619
parents_incom	-0. 419299	0. 2929	-1. 43139
Parents_occupationBusiness	-0. 528010	0.6693	-0. 78886
Parents_occupationSelf Employed	0. 346052	0. 7935	0. 43611
Parents_occupationService ( Govt/Private	) 0. 161225	0. 5800	0. 27797
Self_esteem	1. 468171	0. 3532	4. 15629

#### Intercepts:

Value Std. Error t value 1|2 4.3584 1.6994 2.5647 2|3 7.0645 1.7575 4.0197 3|4 8.5498 1.8119 4.7187

Residual Deviance: 220.759

AIC: 262.759

```
pvalues
```

ctable<-coef(summary(ma))</pre>

pval <- pnorm(abs(ctable[, "t value"]),lower.tail = FALSE)\* 2</pre>

ctable <- cbind(ctable, "p value" = round(pval,3))</pre>

#### ctable

#### Ctable

Cable	Valu	e Std. Error	t valu	e p value
Student_GenderMale	0. 716578103	0. 4662196	1. 53699698	0. 124
Siblings	0. 250983719	0. 2144272	1. 17048435	0. 242
Parents_Education_LevelGraduate	-0. 087403483		-0. 17080673	0.864
Parents_Education_LevelIlliterate	0. 135329724	0.8035261	0. 16841983	0.866
Parents_Education_LevelPost Graduate	0. 180405596	0. 7432176	0. 24273589	0.808
<u>Family_Size</u>	0. 304174804	0. 1780257	1. 70860037	0. 028
`Parents _Temperament _& _Ability`	0. 676632676	0. 3266951	2. 07114450	0. 038
AreaUrban	-0. 064482822		0. 12683725	0. 899
`Careear_Information_of_ Parents`	0. 464602531	0. 4677684	0. 99323204	0. 321
Parents_ExpectationsDisagree	0. 025374938	0. 6818107	0. 03721698	0. 370
Parents_ExpectationsStrongly Agree	0. 176052238	0. 7774350	0. 22645268	0. 521
Parents_ExpectationsStrongly Disagree	0. 343886440	0. 8208652	0. 41893168	0. 675
income_lakhs	-0. 006287938		0. 04619406	0. 663
parents_incom	-0. 419299381		1. 43139422	0. 015
Parents_occupationBusiness	-0. 528010313		0. 78886278	0. 430
Parents_occupationSelf Employed	0. 346051532	0. 7934913	0. 43611258	0. 663
Parents_occupationService ( Govt/Private )	0. 161225332	0. 5800071	0. 27797131	0. 781
Self_esteem	1. 468170538	0. 3532407	4. 15628964	0.000
1   2	4. 358448826	1. 6994003	2. 56469815	0.010
	7. 064490202	1. 7574823	4. 01966511	0.000
3 4	8. 549789226	1. 8118914	4. 71870958	0. 000

#### **Inerpretation:**

since alpha=0.05, *only* Family *Size*(0.028) ,Parent's Temperament & Ability(0.038),Parents income(0.015) and Self esteem(0.00) have p-value less than 0.05, and thus only these four variables are statistically significant. Since there is at least one variable that is statistically significant, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. It means from family background these factors are more affect the career choice of students.

Now, we have to convert the log of odds into odds ratio for easier comprehension. One can also calculate the 95% confidence intervals for each coefficient.

#### # log odd coefficients

```
> or <- round(coef(ma), 4)
> # convert coefficients into odds ratio, combine with CIs
> round(exp(cbind(OR = or, ci)), 4)
                                                        2.5 % 97.5 %
Student Gender
                                              1.5650
                                                       0.6866 3.6107
                                              1.0190
Siblings
                                                       0.7060 1.4746
Parents_Education_Level
                                              0.9482
                                                       0.5380 1.6636
                                                       0.8125 1.5641
                                              1.1229
Family_Size
Parents _Temperament _&
                                              1.3647
                                                       0.7605 2.4831
                                  Ability`
                                              0. 7428
                                                       0.3125 1.7667
                                                       0. 6102 3. 6313
0. 5870 2. 2538
                                   Parents `
                                              1. 4823
Careear_Information _of_
Parents Expectations
                                              1.1403
                                                       0.8014 1.3064
                                              1.0214
income_lakhs
                                              1. 1912
                                                       0.7106 2.0182
parents_incom
Parents_occupation
                                              1. 0275
                                                       0.6885 1.5362
Self_esteem
                                              3. 1775
                                                       1.6056 6.4689
```

#### Interpretation:

Above output is the coefficient parameters converted to proportional odds ratios and their 95% confidence intervals. The interpretation for such is "for a one unit increase in *Family size*, the odds of moving from *Strongly Disagree* to *Strongly Agree* are 1.1229 times greater, given that the other variables in the model are held constant". It means, if more the family size students couldn't chose independently their career.

For another statistically significant variables have proportional odds ratio:

Parents Temperament & Ability (1.3647) ,these will read as for one unit increase in Parents income , the odds of moving from strongly Disagree to Strongly Agree are 1.3647 times greater, Parents Temperament & Ability given that the other variables in the model are held constant. In other word higher Parents Temperament & Ability ,higher will be chances of independent career choice of students.

Parents income (1.1912) ,these will read as for one unit increase in Parents income , the odds of moving from strongly Disagree to Strongly Agree are 1.1912 times greater, Parents income given that the other variables in the model are held constant. i.e The students who are having high family income could chose their career independently. Self esteem(3.1 775), for one unit increase in self esteem, the odds of moving from strongly Disagree to Strongly Agree are 3.1775 times greater, Self esteem given that the other variables in the model are held constant. It means ,students can independently decide their career, if he/she is more confident about their career choice.

#### **Assumptions of Ordinal Logistic Regression**

Since the Ordinal Logistic Regression model has been fitted, now we need to check the assumptions to ensure that it is a valid model. The assumptions of the Ordinal Logistic Regression are as follow and should be tested in order:

1. The dependent variable are ordered:

In this model we have one multi-class ordered dependant variable **CDMI (Career Decision Making Scale)** 

Which has four different levels:

- Strongly Disagree = 1
- Disagree=2
- Agree=3
- Strongly Agree=4

2. One or more of the independent variables are either continuous, categorical or ordinal.

We have the following independent variables

- 1. **Student\_Gender**: Gender of Student Male or Female.
- 2. **Siblings**: Number of Siblings has a student.
- 3. Family Size: Total Family members of a Student.

- 4. **Parent Education Level**: Parents education Level(Illiterate or 5<sup>th</sup> to 12<sup>th</sup> or Graduate or Post Graduate).
- 5. Area: Area in which student is belongs (Rural or Urban).
- 6. Income Lakh: Family's annual income in Lakh.
- 7. **Career\_Information \_of\_ Parents**: It is related to ,any earlier Information to parents about career of Child(Yes=1,No=0).
- 8. Parent's Occupation: It indicate parents occupation of student.
- 9. Parents \_Temperament \_& \_Ability 10. parents\_incom 11. Self esteem

#### 12.Parents expectations

(11,12,13& 14 are the opinion of students about effect of Parents \_Temperament \_& \_Ability , parents\_incom, Parents expectations & Self esteem on their career choice decision.)

#### 3. No multi-collinearity.

A Variance Inflation Factor test should be performed to check multi-collinearity in our data.

```
library("rms")
> vif(ma)
                  Student_Gender
                                                         Siblings Parents_Education_Level
                     2. 621188
                                                    3.967158
                        Area
                                  Parents_Expectations
                                                                            income_lakhs
                 8. 594731
                                                                                6.099758
                                               2. 732853
            parents_incom
                                     Parents_occupation
                                                                             Self_esteem
                 1. 742443
                                                7. 513191
                                                                                4. 297265
                                                        213
                 5.663095
                                               7.730124
                                                                             6.551705
```

The general rule of thumbs for VIF test is that if the VIF value is greater than 10, then there is multi-collinearity. Since non of the VIF values are greater than 10 according to above output (not even close to), we conclude that there is no multi-collinearity in the dataset and assumption 3 is met.

#### 4. Proportional odds

Now we should conduct the Brant Test to test the last assumption about proportional odds. This assumption basically means that the relationship between each pair of outcome groups has to be the same.

To test:

H0: Model holds parallel regression assumption

V/S

H1: Model does not hold parallel regression assumption

library("brant")

brant(ma)

Test for		X2	df	probability
Omnibus		-68. 45	30	1
Student GenderMale		1. 39	2	0. 5
Siblings		2. 42	2	0. 3
Parents_Education_LevelGraduate		2. 5	2	0. 29
Parents_Education_LevelIlliterate		1. 8	2	0. 41
Parents_Education_LevelPost Graduate	2. 66	2	6	
AreaUrban		8. 06	2	0. 2
Parents_ExpectationsDisagree		0. 52	$\overline{2}$	0. 77
Parents_ExpectationsStrongly Agree		48. 55	2	0
Parents_ExpectationsStrongly Disagree	-48. 88	2	1	
income_lakhs		0. 19	2	0. 91
parents_incom		0. 2	2	0. 9
Parents_occupationBusiness		0. 41	2	0. 82
Parents_occupationSelf Employed		0. 64	2	0. 73
Parents_occupationService ( Govt/Private )		1. 56	2	0. 46
Self_esteem		2. 95	2	0. 23

HO: Parallel Regression Assumption holds

assumption alpha=0.0 model, an	the Brant on holds sin 05. The outp nd it is still g ted and the r	ce the prob ut also conta reater than	oability(p ains an On 0.05. Thei	-values) fonibus var refore the	or all varia	ables are a	greater tha or the who

#### Conclusion

The preliminary analysis and Ordinal Logistic Regression analysis are conducted for "Impact of Family Background On Career Choice Of Students". Based on the result of the analysis, we can conclude that Family Size, Parents Temperament & Ability, Parents Income and Self Esteem are the main influential factors that affect the Career Choice of students.

It means, if more the **family size** students couldn't chose independently their career. Higher the **Parents Temperament & Ability**, higher will be chances of independent career choice of students. The students who are having high **family income** could chose their career independently and also can independently decide their career, if he/she is more confident(**Self esteem**) about their career choice.

- Future Scope of Study
- References