

**GENDER GAP IN EDUCATIONAL PERFORMANCE
AMONG MARGINALISED GROUPS:
A STUDY OF ANDHRA PRADESH AND TELANGANA**

*A Dissertation Submitted during 2022 to the University of Hyderabad in Partial
Fulfillment of the Requirements for the Award of the Degree of*

**DOCTOR OF PHILOSOPHY
IN
ECONOMICS
BY**

KULDEEP SINGH NAGI

(Reg. No: 16SEPH16)



**SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
GACHIBOWLI, HYDERABAD
TELANGANA-500046, INDIA
JANUARY-2022**

**GENDER GAP IN EDUCATIONAL PERFORMANCE
AMONG MARGINALISED GROUPS:
A STUDY OF ANDHRA PRADESH AND TELANGANA**

*A Dissertation Submitted during 2022 to the University of Hyderabad in Partial
Fulfillment of the Requirements for the Award of the Degree of*

DOCTOR OF PHILOSOPHY

IN

ECONOMICS

BY

KULDEEP SINGH NAGI

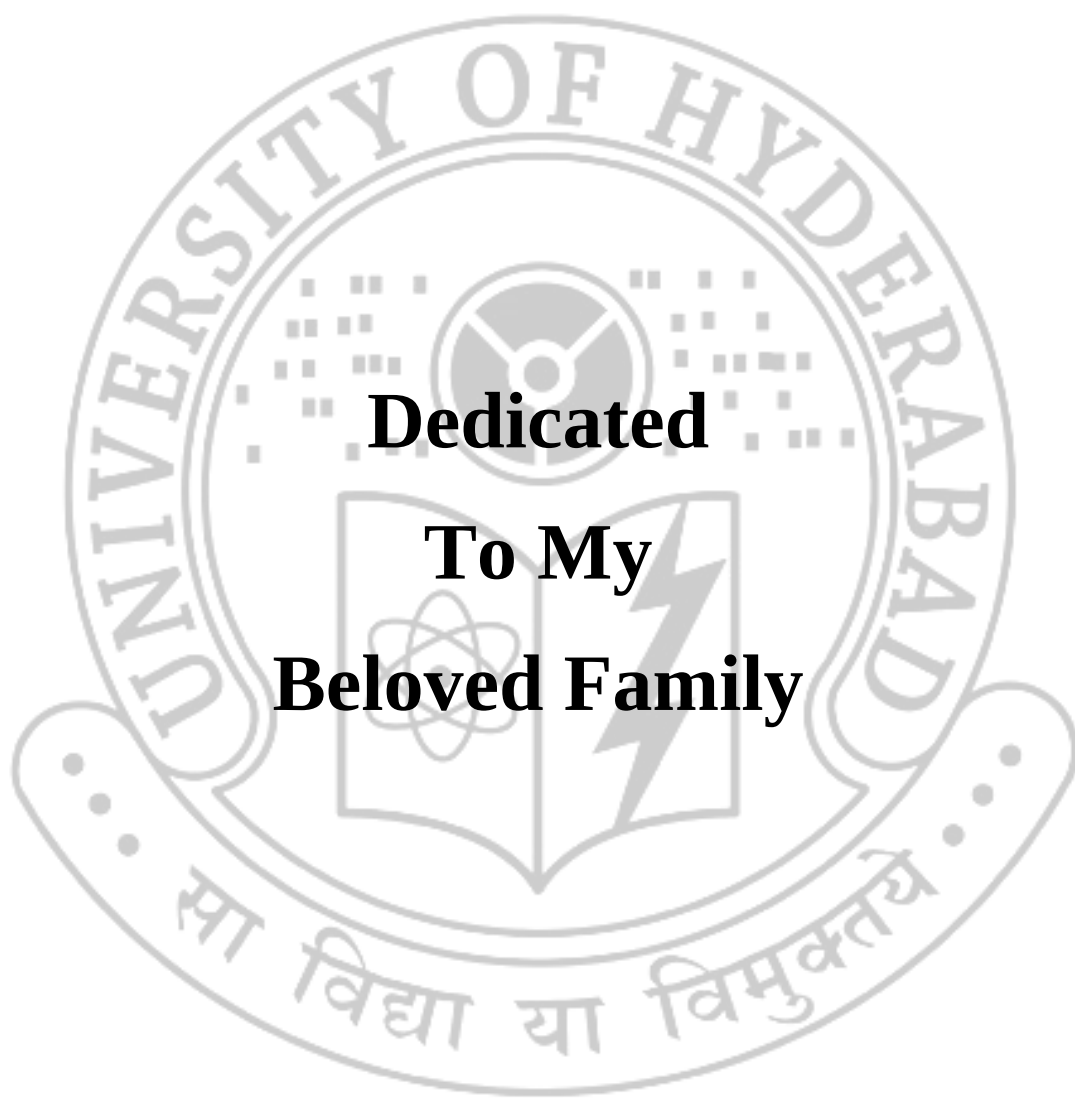
(Reg. No: 16SEPH16)

Under the Supervision of

Dr. G. Sridevi



**SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
GACHIBOWLI, HYDERABAD
TELANGANA-500046, INDIA
JANUARY-2022**





DECLARATION

I, **Kuldeep Singh Nagi**, hereby declare that the research work embodied in the present dissertation entitled “*Gender Gap in Educational Performance among Marginalised Groups: A Study of Andhra Pradesh and Telangana*” submitted by me under the guidance and supervision of **Dr. G. Sridevi**, School of Economics, for the award of Doctor of Philosophy from University of Hyderabad, is a bonafide research work which is also free from plagiarism.

I also declare to the best of my knowledge that no part of this dissertation is earlier submitted for the award of any research degree or diploma in full or partial fulfillment in any other university or institutions. I hereby agree that my thesis can be deposited in Shodhganga/INFLIBNET.

A report on plagiarism statistics from the University Librarian is enclosed.

Place: Hyderabad

Date: 7th January 2022

Kuldeep Singh Nagi

Regd. No: 16SEPH16



CERTIFICATE

This is to certify that the thesis entitled “***Gender Gap in Educational Performance among Marginalised Groups: A Study of Andhra Pradesh and Telangana***” submitted by **Mr. Kuldeep Singh Nagi** bearing registration number **16SEPH16** in partial fulfillment of the requirements for award of **Doctor of Philosophy** in the School of Economics is a bonafide work carried out by him under my supervision and guidance. This thesis is free from plagiarism and has not been submitted previously in part or in full to this or any other university or institution for award of any degree or diploma.

Papers related to this thesis have been:

A. PUBLISHED IN THE FOLLOWING PUBLICATION:

1. Nagi Kuldeep Singh and Gummadi Sridevi (2020), “Gender Gap in Academic Performance in Public and Private Schools: An Analysis of Young Lives Survey for India”, The Empirical Economics Letter, ISSN 1681 8997 volume 19(9): September 2020, pp.941-954.

B. PRESENTED IN THE FOLLOWING CONFERENCES:

1. Presented a paper on "Gender and Educational Performance: Analysis of Young Lives Survey Data for India", in 23rd Annual IPEA Conference on Political Economy of Nexus between State, Big Corporations and Development in India, Punjabi University, Patiala, November 8-9, 2019.
2. Presented a paper on "Gender Based Analysis of Educational Performance: Evidences from Young Lives Survey Data, India " in 56th Annual Conference of the Indian Econometric Society (TIES), The School of Economics, Madurai Kamaraj University, Madurai January 8-10, 2020.

Further, the student has passed the following courses towards fulfillment of the coursework requirement for Ph.D/was exempted from doing coursework (recommended by Doctoral Committee) on the basis of the following courses passed during his M.Phil. Program and the M.Phil degree was awarded:

Sl.	Course	Name	Credits	Pass/Fail
1.	EC7	Advanced Economic Theory	4	PASS
2.	EC7	Social Accounting and Data Base	4	PASS
3.	EC7	Research Methodology	4	PASS
4.	EC7	Study Area	4	PASS
5.	EC7	Dissertation	16	PASS

R. Mani
7/1/2022

Dean

School of Economics
DEAN
SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
Hyderabad-500 046. (INDIA)

Sridevi

Dr. G. Sridevi

Research Supervisor
SUPERVISOR
SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
Hyderabad-500 046 (INDIA)

ACKNOWLEDGEMENTS

Let me take this opportunity to express my heartfelt gratitude to the helping and guiding hands of innumerable people who have left their incredible insights in this work and acknowledging all of them is going to be an implausible task. The degree to which all these people have been involved in my endeavor varies, but my gratitude for all of them is profound. Undertaking this research work has been a truly life-changing experience for me, and this journey would not have been possible to complete without the support and guidance that I have received from the people.

*To begin with, I would like to express my sincere gratitude and indebtedness to my guide and mentor **Dr. G. Sridevi** for her valuable guidance and immense support given to me while doing the work. She devoted a lot of her precious time to helping me at various stages of thesis completion. I have never seen this caring, helpful, humble, supportive, hardworking supervisor. I feel privileged for submitting my dissertation under her. She always inspired me to take up new challenges and think out of the box. Fruitful discussions with my dear guide help me to tread the rather difficult path of research. She always motivated and encouraged me whenever I felt low or stuck during my research. She has a huge contribution in bringing it to this stage and I could see in her eyes, her aspiration to make me a better researcher. She is much more to me than a guide. Let me gratefully acknowledge my adorable guide's encouragement, love, care, and support.*

*I would like to thank **Prof. R. V. Ramana Murthy**, Dean, School of Economics, and other School of Economics faculty members for their cooperation and guidance. I sincerely appreciate the contribution of my doctoral committee members **Prof. Phanindra Goyari** and **Prof. K. Laxminarayana**, for their comments, suggestions, and insights during my work. I also want to thank **Dr. G. Vijay**, **Dr. B. N. Rao**, **Prof. Debashis Acharya**, **Dr. Prajna Paramita Mishra** and the scholars who were present from time to time in my work in progress seminar and gave their valuable comments.*

*I also would like to thank the entire School of Economics teaching fraternity for their precious support and advice. My sincere gratitude to **Sri V. Adi Narayana**, **Srinivas Anna** and all other School of Economics office staff for their support in official paper works. I am also thankful for the kind co-operation rendered to me by the Library staff, computer centre and other administrative sections of the University.*

My honest thanks to Aquib Parvez for helping me in shaping my initial research and for teaching me statistical tools. He has been accommodating and has always been available for any kind of help during my work. I am very grateful to him for his valuable comments on my initial chapters.

I also would like to extend my love and sincere gratitude to my friend Ritapriya Nandy for reviewing my chapters and helping in proofreading my thesis. The journey has become easier with all her help.

I thank the Young Lives Project for providing the data for this research and supporting this study (www.younglives.org.uk). Young Lives is core funded by UK aid from the Department for International Development and cofounded from 2010 to 2014 by the Netherlands Ministry of Foreign Affairs. The views expressed here are those of the author(s). They are not necessarily those of Young Lives, the University of Oxford, DFID or other funders.

I am also indebted to all those people of sixteen villages and for their help in data collection. I extend my gratitude to all my dear children and their parents, whose active participation and high spirits helped me timely collect primary data. I acknowledge the indispensable contribution made by the local residents of my study area, especially Thirupathi, Murali anna, Venkat anna, for providing their support during the fieldwork. My gratitude to Mohan, Atheeq, Matta Srinivas, and Dr Vijay Ambedkar for making this field survey easier as without their help, being a non-telugu speaker, this primary data collection would not have been possible to conduct.

I wish to thank my dear friends and fellow researchers Shubhash, Dhananjay, Keerthana, Saurabh, Matta Srinivas, Donth Prashath, Patturi Balaji, Dr Dibakar Sahoo, Dr Kaashif, and Pandey. I would like to thank Deepak Kumar, Swati, Smita, Shubhangi, NJ, Ayush, Priyali, Arif, Abdus, Rashda, Jaya, Assismon, Dhyan, Basil, and Pankaj for making my campus stay the most adorable period of my life. My special thanks to the hostel staff Venkatesh anna and all my hostel mates for all good memories.

My special thanks to Nirmal, Salim, Anupama, Malavika for being with me whenever I felt low. I would like to thank Students' Federation of India and all the comrades for being with me and transforming my entire perspective towards society.

Last but not least, words seem to be inadequate to express my endless love and gratitude to my family for their unconditional love, for taking an interest in my higher education and keeping faith in me and my capacity to complete the undertaken task. I am grateful to my mother Mrs. Rajinder Kaur, my father, Mr. Manohar Singh, and my brother Mr Rakhvinder Singh, for their unstinted support, encouragement, and affection.

Finally, with immense pleasure and gratitude, I place on record my appreciation to all persons who were helpful to me in completing this work. I owe my sincere thanks to many personalities who helped me in one way or other in finishing this work. I record my heartfelt gratefulness to all who directly or indirectly helped me complete this research work.

Finally, of course, none of the individuals named above is in any way accountable for whatever errors and omission that remains. I am solely responsible for all of them.

By,

Kuldeep Singh Nagi

Gender Gap in Educational Performance among Marginalised Groups: A Study of Andhra Pradesh and Telangana

Abstract

The thesis analyses the gender gap in the educational performance of the children in United Andhra Pradesh, India. The study focuses on child-specific features, parental education and involvement in school activities, household characteristics, type of school, and other features. The study's objective is to find the factors causing the gender gap and the extent to which these factors contribute to the gender gap in educational performance. The study also answers which type of school has more gender gap in educational performance and to what extent these factors contribute. The study also deals with the gender gap in educational performance among marginalised groups in Telangana and Andhra Pradesh. The study has used longitudinal panel data set of the Young Lives Survey of the fourth round for older cohort. The study has also collected data from the primary survey to collect the information about the children from marginalised groups living in Mancherla and Prakasham district of Telangana and Andhra Pradesh. Further, the study has utilised the simple regression model to see the impact of the background characteristics on the educational performance, and a non-parametric approach has been taken by using a t-test to check the background features having a gender-based significant mean difference. The study has adopted the Blinder-Oaxaca decomposition method to identify the factors responsible for gender gap and to measure the extent to which these factors contribute to the gender difference in educational performance. The study finds that males are at an advantageous position compared to females. Gender disparity in educational performance exists in government and private schools. Studies observe that for government school students, the household size affects educational performance in Mathematics. For private school students, years of education contribute to the gender gap. The study also observed that gender gap in educational performance was prevalent in Telangana and Andhra Pradesh for all the subjects where males outperformed females except for English in Andhra Pradesh and Science in Telangana. The study also realises that region (in this case 'state') significantly affects students' overall performance and individual performance in subjects. Regression results show that Andhra Pradesh students perform lower than the students of Telangana, particularly in the case of female students. The majority of the performance gap is because of the differential returns to the background characteristics. For Telangana, BMI, parental education, and midday meals significantly contribute to the gender gap in educational performance. For Andhra Pradesh, time spent on studying apart from schooling hours, midday meal, BMI and type of school contribute to the gender gap.

Keywords: Gender-Gap, Coefficient Effect, Educational Performance, Blinder- Oaxaca, Marginalised Groups, Years of education, BMI, Parental Education, Type of School

JEL Classification: I21, I22, I24, I25, I26, I29

CONTENTS

Declaration	I
Certificate	II
Acknowledgement	IV
Abstract	VI
Contents	VII
List of Tables	XII
List of Figures	XV
List of Abbreviations	XVII

CHAPTER-I

INTRODUCTION 1-28

1.1 Introduction	1
1.2 Education as a Constitutional Right	3
1.3 Central Government's Educational Schemes: An Overview	4
1.3.1 Sarva Siksha Abhiyan (SSA)	4
1.3.2 Mid-day Meal Scheme (MDMS)	5
1.3.3 Kasturba Gandhi Balika Vidyalya (KGBV)	6
1.3.4 National Programme for Education of Girls at Elementary Level (NPEGEL)	6
1.3.4 Rashtriya Madhyamik Shiksha Abhiyan	7
1.3.5 Samagra Shiksha Abhiyan	7
1.4 Research Gap and Contribution of the Study	8
1.5 Major Issues from Literature	9
1.6 Research Objectives and Questions of the Study	10
1.7 Data Sources	11
1.7.1 Secondary Data Sources	11
1.7.2 Primary Data Sources	12
1.8 Study Design, Sample Size, and Primary Data Collection	14
1.9 Description of the Variables	15
1.10 An Overview of Primary Field Site: Andhra Pradesh and Telangana	18
1.10.1 District Profile Selected for the Primary Survey	18
1.10.2 Demographic Profile of the Mandals Selected for Primary Survey	20
1.11 Problem faced during the Field Survey	21

1.12 Methods and Tools of Analysis	22
1.13 Theoretical Framework	22
1.14 Blinder Oaxaca Decomposition: An Empirical Framework	24
1.15 Tests	26
1.15.1 Test for Multicollinearity	26
1.15.2 Test for Heteroscedasticity	26
1.15.3 T-Test	27
1.16 Limitations of Study	27
1.17 Chapter Schemes	27

CHAPTER-II

Review of Literature

29-51

2.1 Introduction	29
2.2 Discrimination against Women	30
2.3 Reasons behind Gender Discrimination and Way Forward	31
2.4 Childhood Characteristics and Educational Performance	32
2.5 Parental Education, Involvement and Educational Performance	39
2.6 Educational Performance and Household Features	42
2.6.1 Availability and Use of Computer	42
2.6.2 Household Size and household resources	43
2.6.3 Household Income and Wealth	45
2.7 Type of School and Educational Performance	46
2.8 Impact of Others Features on Education Performance	49

CHAPTER-III

GENDER GAP IN EDUCATIONAL PERFORMAMNCE IN UNITED

ANDHRA PRADESH

51-85

Abstract	51
3.1 Introduction	52
3.2 Methodology and Data sources	55
3.3 Determinants of Educational Performance	59
3.3.1 Determinants of Performance in Mathematics	59
3.3.2 Determinants of Performance in English	63
3.4 Test for the Validity of Regression Analysis	67
3.4.1 Test for Multicollinearity	67
3.4.2 Test for Hetroscedasticity	68

3.5 Gender-based Mean Difference among Variables: A Non-Parametric Approach	70
3.6 Factors Causing Gender Gap in Performance	71
3.6.1 Subject-wise Average Marks Scored by Students	73
3.6.2 Gender-wise Students from Different Social Groups	73
3.6.3 Percentage of Students availing Fellowship and Computer at Household	74
3.6.4 Gender-wise Average Expenditure on Education and Value of Household Assets	74
3.7 Contribution of the Factors in Performance Gap	78
3.7.1 Factors Contributing to Gender-Gap in Mathematics Performance	81
3.7.1 Factors Contributing to Gender Gap in English performance	82
3.8 Conclusion	83

Chapter-IV

Gender Gap in Academic Performance in Public and Private Schools:

An Analysis of Young Lives Survey for India	86-136
Abstract	86
4.1 Introduction	87
4.2 Statistical Description with Respect to Type of Schools	88
4.3 Factors Determining Educational Performance in Public Schools	93
4.4 Determinants of Educational Performance for Public School Children	96
4.5 Tests for the Validity of Regression Analysis	99
4.5.1 Test for Multicollinearity	99
4.5.2 Test for Heteroscedasticity	100
4.6 A Non-Parametric Approach: Assessment of Gender-Based Differences for Public School	102
4.7 Gender-Wise Statistical Description for Public School	104
4.8 Factors Causing Gender Gap in Performance of Public School Children	108
4.9 Factors Contributing to the Gender-Gap in Educational Performance for Public School Children	113
4.10 Factors Determining Educational Performance in Private Schools	115
4.11 Determinants of Educational Performance for Private School Children	119
4.12 Tests for the Validity of Regression Analysis for the Private School	121
4.12.1 Test for Multicollinearity	122
4.12.2 Test for Heteroscedasticity	122
4.13 A Non- Parametric Approach: Assessment of Gender-Based difference for Private School	125

4.14 Gender-Wise Statistical Description for Private Schools	126
4.15 Factors Causing Gender Gap in Performance of Private School Children	131
4.16 Factors Contributing to the Gender-Gap in Educational Performance for Private School Children	134
4.17 Conclusion	136

CHAPTER-V

Gender Gap in Educational Performance: A Micro-Level Analysis	137-170
Abstract	137
5.1 Introduction	138
5.2 Methodology and Data Source	138
5.3 Micro Analysis- Telangana	142
5.3.1 Gender-wise Descriptive Statistics	144
5.4 Statistical Analysis of gender Based Mean Difference using T-Test for Telangana	146
5.5 Factors Causing Gender-Gap in Educational Performance for Telangana	149
5.6 Contribution of Factors to the Gender-Gap in Performance for Telangana	153
5.7 Micro analysis -Andhra Pradesh	157
5.7.1 Gender-Wise Descriptive Statistics for Andhra Pradesh	160
5.8 Statistical Analysis of gender Based Mean Difference using T-Test for Andhra Pradesh	163
5.9 Factors Causing Gender Gap in Performance	165
5.10 Factors Contributing to the Gender-Gap in performance	167
5.11 Conclusion	169

CHAPTER-VI

Gender Gap and Access to Education a Regional Perspective	171-191
Abstract	171
6.1 Introduction	172
6.2 Gender and Education	173
6.3 Educational Status and Various Policies of the State	178
6.4 The Relationship between Educational Performance and Variables	180
6.5 Determinants of Educational Performance	182
6.6 Assessment of Gender-Based Mean Differences: A Non-Parametric Approach using T-Test	184
6.7 Factors Causing Gender-Gap in Performance	186
6.8 Factors Contributing to Gender Gap in Average Performance	188
6.9 Conclusion	190

Chapter-VII	
Major Findings and Policy Suggestions	192-203
7.1 Introduction	192
7.2 Objective and Research Questions of the Study	193
7.3 Methodology and Data Sources	194
7.4 Major Findings	195
7.4 Policy Recommendations	202
7.5 Scope for the future research	203
Bibliography	204-218
Appendix	
	219-234
Appendix Chapter I	219
Appendix Chapter II	225
Survey Schedule	A-G
Publication	H
Conference Certificates	I-J
Plagiarism Report	

LIST OF TABLES

Name of the Table	PAGE NO.
Table 1.1: Description of Variables	17
Table 1.2: Demographic Profile of the Selected Mandals	21
Table 3.1: Descriptive Statistics	58
Table 3.2: The Regression Results for Mathematics	60
Table 3.3: The Regression Results for English	64
Table 3.4: Test for Multicollinearity of Children Studying in Public School	67
Table 3.5: Result of BP test for the presence of Heteroscedasticity for public school	69
Table 3.6: Gender based means of variables	70
Table 3.7: Descriptive Statistics for Male Children	75
Table 3.8: Descriptive Statistics for Female Children	76
Table 3.9: Blinder-Oaxaca Decomposition Results for Mathematics and English Test Score	80
Table 3.10: Detailed Blinder-Oaxaca Decomposition for Mathematics Test Score	81
Table 3.11: Detailed Blinder-Oaxaca Decomposition for English Test Score	83
Table 4.1: Descriptive Statistics for English and Mathematics for the Children Enrolled School	90
Table 4.2: Descriptive Statistics for variables for the Children Studying in Public School	95
Table 4.3: Regression Analysis for Mathematics and English Test Score of Children Studying in Public School	98
Table 4.4: Test for Multicollinearity of Children Studying in Public School	100
Table 4.5: Result of BP test for the presence of Heteroscedasticity for public school	101
Table 4.6: Gender-Based Means of the Variables for Public School	102
Table 4.7: Descriptive Statistics for Male Students for Public School	105
Table 4.8: Descriptive Statistics for Female Students for Public School	106
Table 4.9: Blinder-Oaxaca Decomposition Results for Public Schools for the Mathematics and English test Score	112
Table 4.10: Detailed Blinder-Oaxaca Decomposition for Mathematics and English Test Score for the Public School Students	114
Table 4.11: Descriptive Statistics for the children studying in Private school	117
Table 4.12: Regression Analysis for Mathematics and English Test Score of Children Studying in Private School	118

Table 4.13: Test for Multicollinearity of Children Studying in Private School	122
Table 4.14: Result of BP test for the presence of Heteroscedasticity for private school	124
Table 4.15: Gender-based means of explanatory variables for Private School	125
Table 4.16: Descriptive statistics for male for private school	128
Table 4.17: Descriptive statistics for Female for private School	129
Table 4.18: Blinder-Oaxaca Decomposition Results for Mathematics and English Test Score	133
Table 4.19: Detailed Blinder-Oaxaca Decomposition for Mathematics and English Test Score for Private School Students	135
Table 5.1: Description of Variables	141
Table 5.2: Descriptive Statistics for Mancheria District, Telangana State	143
Table 5.3: Gender-Based Means of Explanatory Variables for Telangana	148
Table 5.4: Blinder-Oaxaca Decomposition Results for Average, Mathematics, English, Social Science, and Science Score	151
Table 5.5: Detailed Blinder-Oaxaca Decomposition for Average Test Score	153
Table 5.6: Detailed Blinder-Oaxaca Decomposition for Mathematics Score	154
Table 5.7: Detailed Blinder-Oaxaca Decomposition for English Score	155
Table 5.8: Detailed Blinder-Oaxaca Decomposition for Social Science Score	156
Table 5.9: Descriptive Statistics for Prakasham District, Andhra Pradesh	159
Table 5.10: Gender-Based Means of Explanatory Variables for Andhra Pradesh	164
Table 5.11: Blinder-Oaxaca Decomposition Results for Mathematics, English, Social Science, and Science Score	166
Table 5.12: Detailed Blinder-Oaxaca Decomposition for Mathematics Score	167
Table 5.13: Detailed Blinder-Oaxaca Decomposition for Social Science Score	168
Table 6.1: Descriptive Statistics for Mancheria and Prakasham District	174
Table 6.2: The Association between Educational Performance and Variables	181
Table 6.3: The Regression Results for Average Test Score	183
Table 6.4: Gender-based means of explanatory variables for both Districts	185
Table 6.5: Blinder-Oaxaca Decomposition Results for Mathematics, English, Social Science, and Science Score	187
Table 6.6: Detailed Blinder-Oaxaca Decomposition for Overall Average Test Score	188
Table A1.1: All India Gender Wise Arithmetic Level (In %)	205
Table A1.2: All India School Wise Arithmetic Level (In %)	205
Table A1.3: All India Gender Wise Reading Level (In %)	206

Table A1.4: All India School Wise Reading Level (In %)	206
Table A1.5: Gender Wise Arithmetic Level for the Erstwhile Andhra Pradesh (In %)	207
Table A1.6: School wise Arithmetic level for Erstwhile Andhra Pradesh (In %)	207
Table A1.7: Gender Wise Reading Level for Erstwhile Andhra Pradesh (In %)	208
Table A1.8: School Wise Reading Level for Erstwhile Andhra Pradesh (In %)	208
Table A1.9: Class Wise Reading Level for All India, 2014 (In %)	209
Table A1.10: Class Wise Arithmetic Level for All India, 2014 (In %)	209
Table A1.11: Class Wise Reading Level for Erstwhile Andhra Pradesh, 2104 (In %)	210
Table A1.12: Class Wise Arithmetic Level for Erstwhile Andhra Pradesh, 2014 (In %)	210
Table A6.1: The Regression Results for Mathematics Test Score	211
Table A6.2: The Regression Results for English Test Score	212
Table A6.3: The Regression Results for Social Science Test Score	213
Table A6.4: The Regression Results for Science Test Score	214
Table A6.5: Descriptive Statistics for Male Students of Mancheria and Prakasham District	215
Table A6.6: Descriptive Statistics for Female Students of Mancheria and Prakasham District	216
Table A6.7: Detailed Blinder-Oaxaca Decomposition for Mathematics Test Score	217
Table A6.8: Detailed Blinder-Oaxaca Decomposition for English Test Score	218
Table A6.9: Detailed Blinder-Oaxaca Decomposition for Social Science Test Score	219
Table A.10: Detailed Blinder-Oaxaca Decomposition for Science Test Score	220

LIST OF FIGURES

Name of the Figures	PAGE NO.
Figure 1.1: Schooling Access and Quality Indicators	9
Figure 1.2: Sample Design for the Primary Data Collection	13
Figure 1.3: Map for Mancherla District, Telangana State	19
Figure 1.4: Map for Prakasham District, Andhra Pradesh	20
Figure 3.1: Subject-wise Average Marks Scored by Students	77
Figure 3.2: Gender-wise Students from Different Social Groups	77
Figure 3.3: Percentage of Students availing Fellowship and Computer at Household	77
Figure 3.4: Gender-wise Average Expenditure on Education and Value of Household Assets	77
Figure 4.1: Subject-Wise Average Marks of the Students in Schools	91
Figure 4.2: Gender-Wise Number of Students in School	91
Figure 4.3: Average Body Mass Index of a Student Enrolled in School	91
Figure 4.4: Percentage of Students from Different Social Background in Schools	91
Figure 4.5: Average Hours Spent on study apart from School Time by a Student	92
Figure 4.6: Years of Education Received by a Student and Parents	92
Figure 4.7: School-Wise Percentage of Students having Availability of Fellowship and Computer at Household	92
Figure 4.8: School-Wise Average Expenditure on Education and Value of Household Assets of a Student	92
Figure 4.9: Subject-Wise Average Marks Scored by Students of Public School	107
Figure 4.10: Gender-Wise Percentage of Public School Students from Different Social Groups	107
Figure 4.11: Gender-Wise Percentage of Public School Students having Availability of Fellowship	107
Figure 4.12: Gender-Wise Average Expenditure on Education and Value of Household Assets of Public School Students	107
Figure 4.13: Subject-Wise Average Marks Scored by Students of Private School	130
Figure 4.14: Gender-Wise Percentage of Private School Students from Different Social Groups	130
Figure 4.15: Gender-Wise Percentage of Private School Students having Availability of Fellowship	130

Figure 4.16: Gender-Wise Average Expenditure on Education and Value of Household Assets of Private School Students	130
Figure 5.1: Gender-Wise Performance in Different Subjects for Mancherial District	144
Figure 5.2: Gender-Wise Enrolled Students from different Social Groups for Mancherial District	145
Figure 5.3: Gender-Wise percentage of Students concerning the Dummy variables for Mancherial District	146
Figure 5.4: Gender Wise Performance in Different Subject for Prakasham District	160
Figure 5.5: Gender-Wise Enrolled Students from different Social Groups for Prakasham District	161
Figure 5.6: Gender-Wise percentage of Students concerning the Dummy variables for Prakasham District	162
Figure 6.1: Gender-Wise Performance in Different Subject	175
Figure 6.2: Gender-Wise Enrolled Students from different Social Groups	176
Figure 6.3: Gender-Wise percentage of Students concerning the Dummy variables	177

LIST OF ABBREVIATIONS

ASER	Annual Status of Education Report
MDMS	Mid-day Meal Scheme
KGBV	Kasturba Gandhi Balika Vidyalya
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
TEIs	Teacher Education Institutes
SSA	Sarva Siksha Abhiyan
Std. Dev.	Standard Deviation
N	Number of Observation
NAS	National Achievement Survey
NGO	Non-Government Organization
NPEGEL	National Programme for Education of Girls at Elementary Level
NP-NSPE	National Programme of Nutritional Support to Primary Education
BMI	Body Mass Index
C	Child specific feature
CLRM	Classical Linear Regression Model
Coef.	Coefficient
B-O	Blinder-Oaxaca
B-P Test	Bressch-Pagan test
DHS	Demographic and Health Survey
YLS	Young Lives survey
H	Household characteristics
Max.	Maximum
Min.	Minimum
Obs	Observation
P	Educational Performance
PE	Parental Education
VIF	Variance Inflating Factor
YL	Young Lives

CHAPTER-I

INTRODUCTION

“Education is not for profit. If you’re not in education for profit, it’s not going to be a fair critique for education”

-Noam Chomsky

1.1 Introduction

Education is the key switch for any social, economic, and political change. In the 21st century, well-equipped with required knowledge, skills are essential and fundamental for social and economic growth. Education is the most critical lever to make an equitable and just society. In assessing the importance of education, the aspect of educational performance cannot be ignored. In all these years, it can be seen that educational performance is dependent on many factors which can be classified into three characteristics like child-specific features which includes gender of the child, time spent on study by child, nutrition level of the child, social background, and availability of the fellowship. Parental education includes education level achieved by mother and father of the child. Household factors such as household size, availability of the computer at house, expenditure on education, household assets. While education should be an equal right for men and women alike, the reality presents a slightly different picture. Delving deep into the analysis of educational performance, the appalling gender gap must not be overlooked.

Education is an unjustly decent indicator of development and, the right of each to education is one of the first provisions of the Universal Declaration of Human Rights (1948).¹ Since independence, education in India is in a deplorable condition. In postcolonial India, the literacy rate was barely 12 percent. After independence, only 9% women and 27% men were literate. The makers of India’s constitution had decided to provide free and compulsory education to all the children up to age 14. However, till today, the goal seems to be unfulfilled. India has a long-drawn history of neglecting its women, and the pattern is as yet proceeding. Nearly twelve million girls have been aborted in recent decades (Singh *et. al.*, 2018). Education is an investment good not a consumption good (Schultz, 1967) and should be treated as an

¹<https://www.un.org/en/universal-declaration-human-rights/>

investment in human capital (Vennikar, 2000) since it increases the skill level and enhances the productive knowledge (Balatchandirane, 2003).

The wretched state of women has its underlying foundations in ignorance of parents who fail to educate their daughters (Desai, 1994). Behavioural patterns of the parents is integral to a child's education (Ghosh, 2011), if the parents are perfectly capitalist in nature, they will be completely centered around benefit, and they will prefer a male child and, on an unlikely chance that the parents are perfectly altruistic, both the genders will be equally welcomed in the family. The social norms won't have any impact on the decision of parents, and the investment for human capital accumulation will be the equivalent for both the sexes. Women education has non-monetary advantages, for example, less fertility, less mortality rate, and formation of human capital for the next generation. The net rate of return in women's education and training is more noteworthy than that in men's, and it affects economic growth positively (Özpolat and Yıldırım, 2009). Numerous researches have been divulging the cardinal connection between education and economic growth (Duraismy and Duraismy, 1993; Duraismy, 2002; Klasen and Lamanna, 2009; Balatchandirane, 2003) whereby they suggest that economic growth will increase if gender disparity in education and employment is brought down.

While addressing the second all India depressed classes women's conference held on 20 July, 1942 at Nagpur, Dr. B. R. Ambedkar said *"I measure the progress of community by the degree of progress which women have achieved"*.

In 1947, with independence, India inherited an education system which was not only quantitatively limited but also consisted of regional and structural imbalance. The literacy rate was just 14 percent and only one out of every 3 children was enrolled for primary education. Soon after independence, providing education was the responsibility of the states. Education included in the concurrent list after the Constitutional Amendment of 1976. The role and responsibility for the states stay the same. However, the Central Government has agreed to share an immense responsibility to implement the national and integrated education character, maintaining the quality and standards, including study and monitoring the country's educational requirements.

1.2 Education as a Constitutional Right

Article 45 related to Directive Principles of State Policy of the Constitution suggested that within 10 years of the implementation of the constitution, it is the duty of the state to provide free and compulsory education for 14 years children (Pandey, 2011, pp. 414-415).

86th Constitutional Amendment act under Article 21A stated that every child belonging to the age group of 6 to 14 has a right to free and compulsory education. Private schools need to take at least 25 percent admission without fee based on reservation for the economically disadvantaged communities (pp. 295-298).

Article 29 (1) of the constitution suggests “Any section of the citizens residing in the territory of India or any part thereof having a distinct language, script or culture of its own shall have the right to conserve the same” (p. 347). Article 29(2) ensures that “no citizen shall be denied admission into any educational institution maintained by the State or receiving aid out of State funds on grounds only of religion, race, caste, language or any of them” (p. 349).

Article 30 (1) provided that “all minorities, whether based on religion or language, shall have the right to establish and administer educational institutions of their choice” (p. 350). Whereas Article 30 (2) provided that “the state shall not, in granting aid to educational institutions, discriminate against any educational institution on the ground that it is under the management of a minority, whether based on religion or language” (p. 351). Article 350-A provided that “it shall be the endeavour of every State and of every local authority within the State to provide adequate facilities for instruction in the mother-tongue at the primary stage of education to children belonging to linguistic minority groups; and the President may issue such directions to any State as he considers necessary or proper for securing the provision of such facilities” (pp. 730-731).

The promotion of educational and economic interests of Scheduled Castes, Scheduled Tribes and other weaker sections suggested in Article 46. It says “The State shall promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and shall protect them from social injustice and all forms of exploitation” (p. 415).

1.3 Central Government's Educational Schemes: An Overview

Government of India has started a number of schemes and projects to achieve universalization of elementary education. As stated in the National Education Policy, education of equitable quality to fully harness the nation's human resource potential has acquired an integrated way of implementing the various centrally sponsored schemes. The universal aspirations are to make access by enhancing the quality of a school, encourage equity by including disadvantaged groups and weaker sections, and raise education quality.

In the Education Sector, the Ministry of Human Resource Development is implementing the following centrally sponsored programmes:

1.3.1 Sarva Siksha Abhiyan (SSA)

The Indian government's flagship initiative, Sarva Siksha Abhiyan (SSA), aims to universalize elementary school education in a time-bound way. The 86th Amendment to India's constitution establishes free and compulsory education as a basic right for children aged 6 to 14. (Article-21A). SSA is implemented across the country in collaboration with state governments. The plan was sponsored by the central government and funded from revenue collected by a new cess, which began at 2% of all taxes in 2004 and climbed to 3% in 2007. The SSA offers financing to states for the construction of new schools and the improvement of existing school facilities. It also covers the cost of civil work and the salaries of extra teachers, bringing the pupil-teacher ratio down to 40:1. By offering intensive training programmes, resources for teaching-learning generated via other funds, and strengthening academic resource centres at the block, cluster, and district levels, SSA helped to enhance current teachers. SSA also involves demand-side strategies to bridge or minimise the caste and gender gap in education, in addition to supply-side interventions. It gives all female and backward caste students free books, extra facilities for girls, and grants to help pupils with impairments or special needs. SSA also helps pupils cross the digital gap by providing computer instruction.

According to the evaluation SSA final report (2019), access to primary education has been universalized. The participation of SC, ST, Muslim and children with special needs has increased. SSA has significantly impacted elementary schools' infrastructure, especially the extra classroom and toilet facilities. Contrary to it, the ASER (2018) report says that only 65 percent of schools have usable toilets, research also shows that only 62.81 percent of schools have accessibility to electricity.

1.3.2 Mid-day Meal Scheme (MDMS)

In 1995, India launched the National Programme of Nutritional Support to Primary Education, which included a mid-day meal programme (NP-NSPE). The National Program of Mid-Day Meals in Schools, often known as the Mid-Day Meal Scheme, was renamed NP-NSPE in October 2007. The scheme's primary objectives were to increase the children's enrolment from disadvantaged sections, increase school attendance, and make sure students remain in school till class eighth. In 2001, MDMS became cooked mid-day meal scheme. As a result, It offered a cooked midday meal to every kid in every government and government-aided school for a minimum of 200 days, with a minimum composition of 300 calories and 8 to 12 grammes of protein. The scheme provides lunch to 120 million children in every school per day and, as such, is the world's most extensive school meal programme. The system was originally implemented in Tamil Nadu. MDMS was amended in 2004, and it became a centrally funded project, with the central government providing grain, transportation costs, and food preparation costs, while the state government supplies the essential infrastructure for food preparation. This plan also includes class 6-8 pupils learning in 3,479 Educationally Backward Blocks and, in 2008, SSA-supported madrasas and maktabas. "The fact that mid-day meals have become a part of the daily routine in most elementary schools across the country is a great success," Khera (2006) said of MDMS, which had an issue with quality and corruption.

Although there is no rigorous evaluation of this scheme's impact on children's school enrolment and attendance and nutritional and health status. According to the National Campaign on Dalit Rights to the UN Committee on Economics, Social and Cultural Rights, 2008, the midday meal is generally served in dominant-caste localities. Dalit children are denied the meal and these upper caste communities assert dominance during situations of caste tension. Another demerit of the scheme is limiting the children's access to the MDMS by linking AADHAR to midday meal scheme as may do not have AADHAR cards. Despite relatively higher budget allocation that existed so far, time and again there have been instances of the scheme going wrong. More than a decade has passed since the programme is made universal with the central government's aid. But almost 20 percent of the school under the scheme are yet to have their kitchen and store. In contrast, 49 percent of the schools do not have handwashing facilities. An estimated 6.5 million children do not have access to clean drinking water (SSA, 2018).

1.3.3 Kasturba Gandhi Balika Vidyalya (KGBV)

The KGBV, introduced by the Indian government in 2004, is upper primary-level residential schools for girls belonging predominantly from SC, ST, OBC, and minorities. KGBV is set up in a scattered habitation area where distance between school and house raises girls' security challenges. It is one of the leading causes for discontinuing girl education. The scheme is focused on the educationally backward blocks where the gender gap in literacy is more than the national average. KGBVs works for adolescent girls who cannot go to school, out of school girls belonging to the 10+ age group, and girls of migrated populations. KGBVs reserved 75 percent of the seats for girls from SC, ST, OBC, and minorities' background and 25 percent seats reserved for the families living below the poverty line. In the eleventh Five Year Plan, 2007 KGBV was merged with SSA programme as a separate component.

1.3.4 National Programme for Education of Girls at Elementary Level (NPEGEL)

The National Programme for Education of Girls at the Elementary Level (NPEGEL), 2003 is an amendment to the SSA that provides additional support for emphasising girl's education over and above the investments for girl's education made under the regular SSA scheme. This means that NPEGEL will operate under the SSA umbrella but with distinct goals. The strategy is implemented in the Educationally Backward Blocks that have been chosen. Female literacy rates are lower than the national average, especially in urban slums and in blocks with SC/ST female literacy rates of less than 10%. NPEGEL is a non-profit organisation that focuses on the needs of girls both in and out of school. It also reaches enrolled pupils who do not go to school on a regular basis. The scheme focuses on the teacher's responsibility to identify vulnerable girls and pay extra attention to bring them out of that vulnerability and reduce the drop-out rate. The scheme also focused on creating a management structure that can respond to the girls' education issues, develop innovative gender sensitization or training programmes, provide quality teaching-learning materials in regional languages, break gender stereotypes, and create an environment favourable for girl's education in the school.

Both NPEGEL and KGBV works in tandem to complement efforts under the umbrella of SSA to ensure inclusionary quality education for girls. While NPEGEL focus on day schools, KGBV focus on establishing residential facilities in remote areas for girls².

1.3.4 Rashtriya Madhyamik Shiksha Abhiyan

Rashtriya Madhyamik Shiksha Abhiyan is a centrally sponsored scheme, introduced in 2009-10. With sharing funds in the ratio of 75:25 between centre and states, RMSA emphasizes accessibility to secondary education and increases enrolment by providing a secondary school within a reasonable distance. It also aims to remove gender, socio-economic and disability gap in enrolment, drop-out, and improve school retention. The physical facilities provided under RMSA are an extra classroom, laboratories, libraries, drinking water provisions, and residential hostels for teachers in remote areas. The quality intervention under RMSA includes teachers' appointment to reduce the pupil-teacher ratio to 30:1, the main focus on science, mathematics, English education, teachers' training, ICT enabled education, curriculum and teaching reforms. The equity interventions include the particular preference to open the schools in the areas with more SC/ST/Minorities population, Special enrolment drives for the weaker section can lead to an increase of female teachers in schools and separate toilets for girls.

1.3.5 Samagra Shiksha Abhiyan

Samagra Shiksha Abhiyan was started in 2018-19 to treat school education holistically without segmentation from pre-nursery to class12. The initiative aims to achieve universal access, equity, and quality, as well as promote vocationalisation and enhance Teacher Education Institutes (TEIs). This programme was started by the government as a centrally supported programme, which means that the states will have absolutely no say in allocating resources. According to the mission's stated goals, it envisages that "By 2030, ensure that all boys and girls complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes." The document further states that the plan will ensure that, "By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations." The primary objectives of the

²India. Ministry of Human Resource and Development, Department of School Literacy and Education, Annual Report, 2011-12, pp. 27-28

scheme are providing quality of education and emphasize on learning outcome, reducing social and gender gap in school education, ensuring and making school education inclusive at all levels, maintaining basic standard in schooling provisions, vocationalisation of education, help states/UTs in implementing Right to Children to Free and Compulsory Education Act, 2009, strengthening nodal agencies for teaching training.

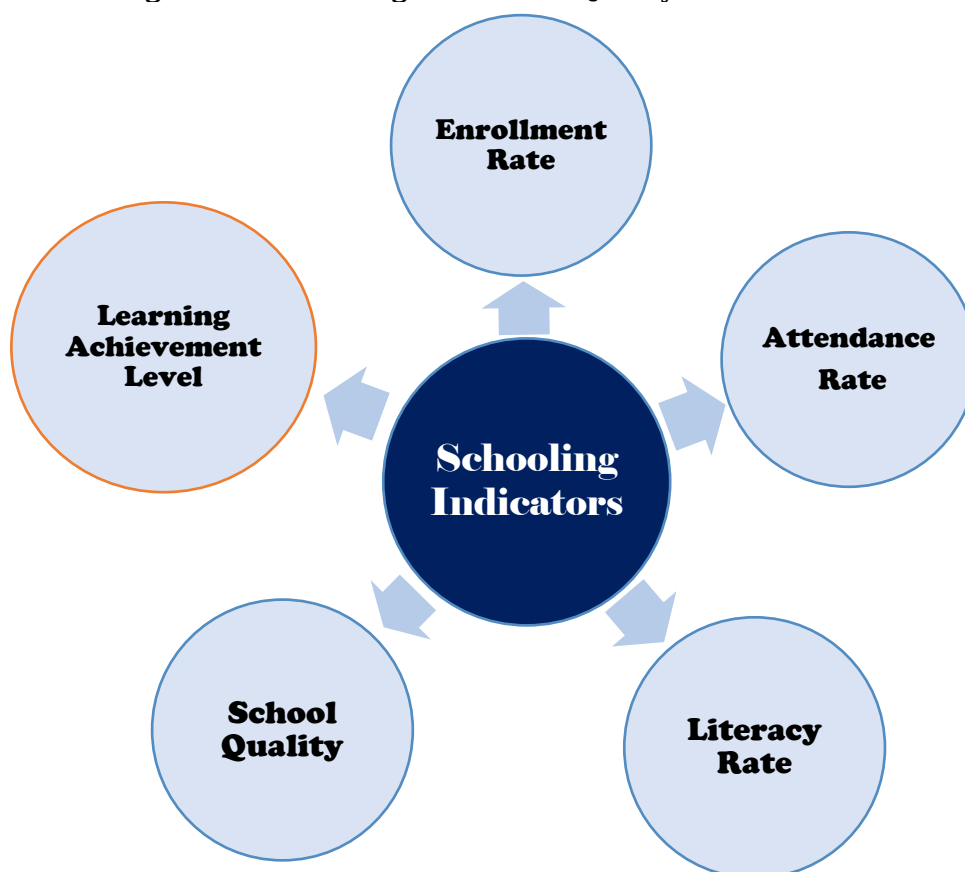
The National Achievement Survey (NAS-2014) depicts a critical contrast across states in the average level of students' performance. The same report by NAS-2014 found that sex-based distinction is noticeable for the province of Andhra Pradesh in instructive accomplishment. There is a gender gap in reading and Mathematics in Andhra Pradesh, where girls outperform the boy in text and boys perform better than girls in Mathematics.

1.4 Research Gap and Contribution of the Study

The Constitution of India states that free and compulsory education must be provided to all children up to age 14. However, the practical implementation of this provision remains largely unfulfilled. Certain indicators of schooling access and quality can be mentioned such as primary and secondary enrolment rate, school attendance rate, literacy rate, school quality and learning achievement levels in primary and secondary education as shown in Figure 1.1.

A detailed review of literature finds that there are different background features of the children which affect their educational performance. The available literature focuses on the relationship of these background features with educational performance. The available literature analyses the gender gap in educational performance but this study goes beyond to analyse the gender gap and finds the factors responsible for gender gap and, using the Blinder-Oaxaca decomposition method, measures the extent to which these background features contribute to the gender gap in educational performance.

Figure 1.1: Schooling Access and Quality Indicators



Source: Kingdon, 2007

1.5 Major Issues from Literature

This study is important because different background characteristics affect educational performance directly or indirectly and widen the gender gap in educational performance. Unfortunately until 2006, no national data was available on India's learning achievement level. Since 1996, Pratham, India's largest educational non-government organisation (NGO), has been working with the children living in India's villages and urban slums. Over the period, it has developed a tool to assess children's reading and arithmetic progress using a standard metric. Pratham, which has been working with children for a long time, found that although children were in school, there is a learning gap which motivated the current study.

Following the findings by Pratham, the Annual Status of Education Report (ASER) concept was started with an annual survey, collecting information about the children's and arithmetic level to find the children's learning status. ASER adopted the same reading tool utilized by the Pratham for many years and inculcated a similar arithmetic assessment. It is also the only source of annual information regarding children's learning levels in India.

ASER (2010, 2014) data for united Andhra Pradesh and India level reflects that there is a gender based difference in the performance for the arithmetic and reading level. A clear learning gender gap could be seen as more of male children can solve the simple division problem compared to female children who are in school. Similarly, gender gap is visible in government and private schools but data shows private school students are performing better than public school students. The ASER data for the year of 2010 and 2014 for the all India and United Andhra Pradesh has been extracted and presented in tabular form in the Appendix Table A1.1 to A1.12

While extensive research has been done previously which has focused on various schooling access and quality indicators like enrolment rate, attendance rate, school quality and literacy rate, limited studies have concentrated on the learning achievement level of children. Hence, this study focuses primarily on the learning achievement level of children.

1.6 Research Objectives and Questions of the Study

This section discuss the objective of the study. The study attempts to find the factors causing the gap and the extent to which these factors contribute to the gender gap in educational performance. The study also answers which type of school have more gender gap in educational performance and to what extent these factors contribute. The study also deals with the gender gap in educational performance among marginalised groups in Telangana and Andhra Pradesh.

Research Questions:

Followings are the research questions of the study.

1. Is there a gender-based disparity in the educational performance?
2. If there is a disparity, what factors cause gender disparity and the extent to which these factors contribute to the gender gap in educational performance?
3. Does there exist any gender gap in educational performance in public and private schools?
4. Which type of school has more significant gender disparity in educational performance and what are the variables causing this gender disparity?
5. Is there any gender gap in educational performance among marginalized groups in Telangana and Andhra Pradesh?

6. If yes, what are the variables causing this gap in educational performance in both the states separately?
7. Is there any gender disparity in educational performance across states and what is the role of state in determining the gender gap in educational performance among the marginalized groups and other determinants affecting educational performance between states?

1.7 Data Sources

The research technique and data sources serve as a guide and motivation for answering the research questions that have been posed. This Section exhibits the data sources, variables and the methodology framework that have used to analyses the educational performance (Mathematics and English) and reasons for gender gap in educational performance in India (Andhra Pradesh). To begin with, the section discusses the detailed information about the secondary data and the process of data cleaning for the analysis. Additionally, it displays and elaborates the selection of variables from the secondary data set. Further, the section provides a detailed sample design, house listing process, method of sample selection about the primary data collection on child characteristics, household characteristics and educational performance and attainment of the children and parents respectively. Lastly, this section discusses the detailed information on the educational performance function and econometric analysis of the educational performance. Apart from this, the section presents the Blinder-Oaxaca methodology for decomposition. The study also explains T-test, test for multicollinearity and heteroscedasticity.

1.7.1 Secondary Data Sources

The information utilized for the study is one of a kind and dataset collected by Young Lives Survey. The study uses the fourth round of data for India and the older age cohorts. There were many variables where the information was unavailable. Majority of the information was unavailable on the parental education variable. To deal with that, we have dropped the observations, and eventually, for the fourth round, where it has covered 952 children, we ended up with 809 observations in which 404 are male, and 405 are female children.

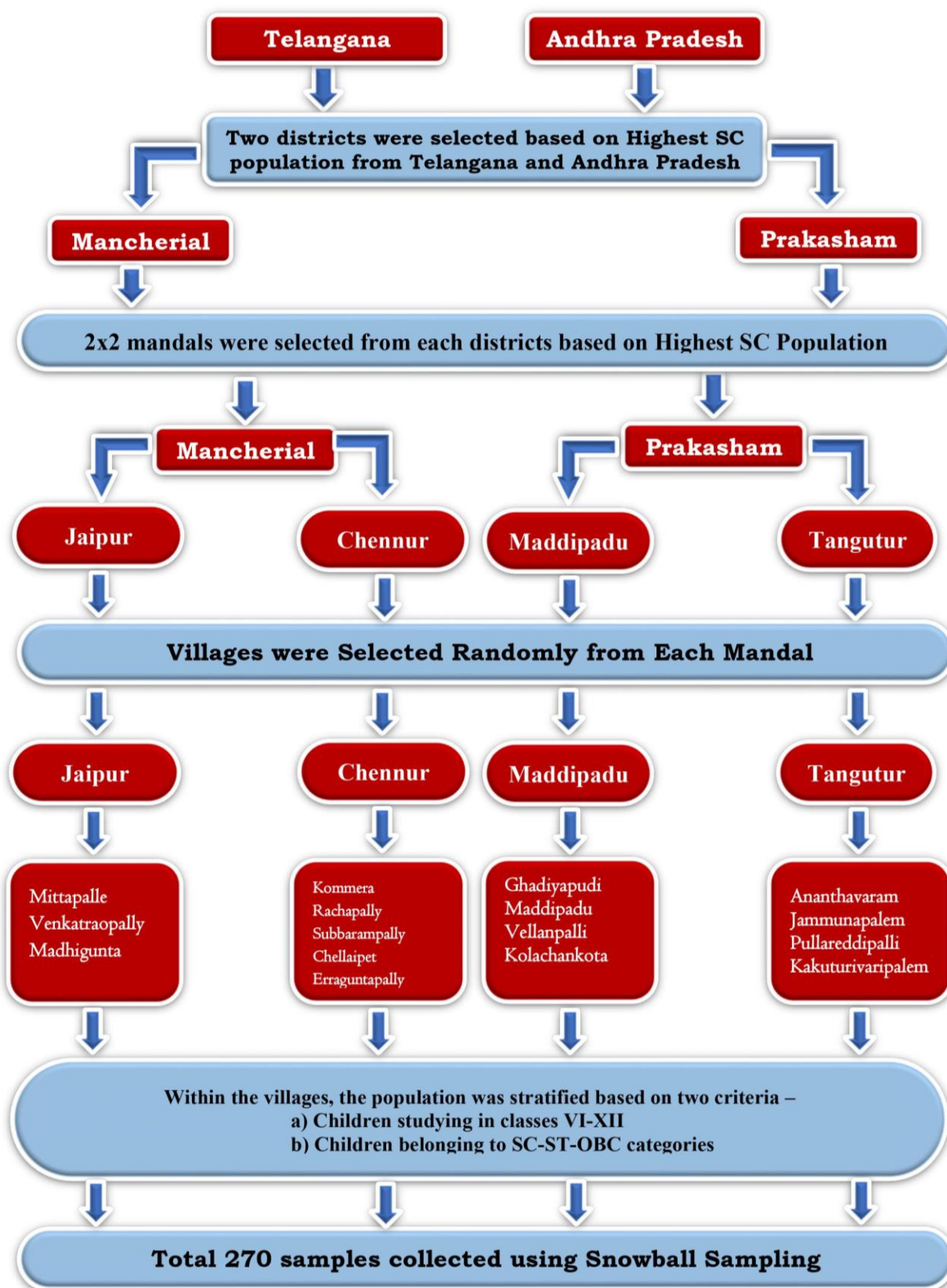
Uniqueness of the YLS dataset

Unlike Demographic and Health Survey (DHS), Young Lives survey is not a nationally representative survey. It is a longitudinal study and intends to represent the changes for individuals over the period of time and the impact of such circumstances on the later outcomes of the children. Comparing to the DHS 1998-99 study, it is seen that the Young Lives sample include households with better access to services and higher ownership of assets and is more updated. According to Wealth Index scores, Young Lives households are wealthier than the average households in Andhra Pradesh. This difference can be explained by the fact that YLS conducted its study at a later point of time than DHS. It also covers the diverse sample of poor households in Andhra Pradesh. While it is not fit for monitoring child outcome indicators, YLS sample is an important resource in analyzing causal relations and examining child welfare and its dynamic nature over time.

1.7.2 Primary Data Sources

The study has done a primary data collection. Primary data has been collected using a pre-tested interview schedule. To assess the questionnaire's effectiveness, a pilot research with 10% of the total sample size was done. The fieldwork consist a survey for collecting information through well-structured questionnaire that consist the information about household characteristics, parental qualification and involvement in school activities, demographic and other particular of the children, school infrastructure, expenditure on education, fellowship/scholarship, how much time a child spend on different activities during a typical day, and details of the five most valuable assets available at household. It has collected 270 samples from 16 villages of four mandals – Jaipur and Chennur in Mancherial district of Telangana; Maddipadu and Tangutur in Prakasham district of Andhra Pradesh. The collected data is divided into four groups; Child specific features, Parental Education, Household characteristics, and other features. To measure the performance of the child, the marks scored in previous year exam was collected for the Mathematics, English, Social Science, and Science subject. To measure the overall performance of the child the average marks scored in all the subject is taken into consideration.

Figure 1.2: Sample Design for the Primary Data Collection



Source: Author's own calculation.

1.8 Study Design, Sample Size, and Primary Data Collection

Based on the information about the state, district, and mandals the study has selected Jaipur, Chennur, Tangutur, and Maddipadu for primary survey. These four mandals have the highest proportion of the SC population in their respective districts. ASER (2014) indicates gender gap in educational performance in Telangana State and Andhra Pradesh. Therefore, the study has calculated sample size required to study gender gap in educational performance among marginalized groups in Telangana and Andhra Pradesh using sample size determination technique:

$$\eta = \frac{z^2 * p * (1 - p)}{e^2}$$

Where z denotes the 95 percentage confidence interval and e represents absolute precision. Given a 5 percent absolute precision in this case (Naing, 2003). The study has utilized enrolment rate of the children of age group between 8 to 10 years, 11 to 13 years and 14 to 16 years collected by ASER, conducted in 2013 to calculate the sample size for the primary survey. The enrollment rate for the children of age group of 8 to 10 is 98.8 percent. The enrollment rate is calculated at 96.3 for the 11-13 years old children and for the 14-16 years age group it is 85.5 percent. Therefore, for the given enrolment rate for different age groups, sample size calculated is 19 for the age group of 8-10 years old, and sample size is 55 for the age group of 11-13, and 191 sample sizes has been calculated based on the enrolment rate for the age group of 14-16 years. Hence, the study has collected 270 sample size for the students enrolled in school that qualify the minimum sample size required for the study, using sample size determination formula. Study tried to represent all the marginalized group children i.e., SC, ST, and OBCs.

The study has collected data, for the purpose of measuring gender gap in educational performance among marginalised groups, using multi-stage (random) sampling. The Figure 1.2 shows the process of data collect. It has collected 270 samples from 16 villages of four mandals – Jaipur and Chennur in Mancherial district of Telangana; Maddipadu and Tangutur in Prakasham district of Andhra Pradesh. At first, the two districts from Telangana and Andhra Pradesh were selected on the basis of the highest SC population. Subsequently, two mandals were chosen from each district having the highest SC population. The villages were chosen randomly – Mittapalle, Venkataopally and Madhigunta in Jaipur mandal, Kommera,

Rachapally, Subbarampally, Chellaipet and Erraguntapally in Chennur mandal, Ghadiyapudi, Maddipadu, Vellanpalli and Kolachankota in Maddipadu mandal, Ananthavaram, Jammunapalem, Pullareddipalli and Kakaturivaripalem in Tangutur mandal. Within the villages, the population was stratified based on two criteria – a) Children studying in classes VI-XII, and b) Children belonging to SC-ST-OBC categories. Further, snowball sampling method was used to identify the sample population meeting the aforementioned conditions. Data collection was carried out between the month of February and September, 2021.

1.9 Description of the Variables

The main interest of the study is to analyze the educational performance of the children. In this study educational performance is measured as cognitive ability and language knowledge of the child. The Young Lives survey measures this as child's score in Mathematics and English tests. The study has segregated the explanatory variables into three categories. The variables in Table 1.1 are considered for the study and categorised into child-specific features, parental education, and household features based on the objectives and the existing literature. The dependent variables, the explanatory variables, and their descriptions are explained in the Table 1.1.

Firstly, child specific features, includes gender, time to study, BMI, Years of education, social groups and the availability of the fellowship. Now, the study has created the dummy variables for the gender (=1 if male, 0 otherwise), we created three dummies for the social groups of the child belongs to i.e. (=1 if the child is SC, 0 otherwise), (=1 if the child is ST, 0 otherwise), (=1 if the child is OBC, 0 otherwise). Similarly, if the child is availing fellowship or not, dummy variable is being created for the same i.e. (=1 if yes, 0 otherwise). The variable time to study refers to the time spent on study by a child apart from school hours³. To measure childhood nutrition, study has utilized child's height- for-weight BMI score. Many literatures find that this is one of the most accurate measures of baby and child nutritional status (Glewwe *et al.*, 2001; McKee and Todd, 2011). BMI is being calculated by taking the ratio of weight and squared height where weight is in kg and height is in meters.⁴ The years of education is available in Young Lives data as years of schooling a child has received at the time of survey.

³ How much time a child has spent in doing homework or studying at home during a typical day, not a weekend or holiday, in hours

⁴ If the value for BMI is less 18.5 kg/m² child is considered as underweight, if the value is between 18.5 kg/m² 24.9 kg/m² child is considered as normal. If the BMI is 25 kg/m² to 30 kg/m², it falls under overweight range. If

Secondly, the variables were segregated into factors of parental education. Parental education refers to level of education received by mother and father of the child. The education of parents is given in completed years (number of years).

Thirdly, household characteristics include expenditure on education, household size, value of assets, and availability of the computer. Expenditure on education indicates to the total amount spent in last academic year by a household on child's education. To calculate the total expenditure on education, the costs of education reported by the head of the family during the previous academic year were summed in the survey⁵. The study has also taken household size into consideration as pervious research shows that household size affects the educational performance because of limited parental and economical resources. The value of assets in the study is used. Values of assets is being calculated by summing five most valuable assets in the household. The availability of computer in house influences the cognitive ability of the child. The study used dummy for the availability of the computer.

the BMI is greater than or equal to 30 kg/m² it falls within obesity range.
<https://www.cdc.gov/obesity/adult/defining.html>

⁵ These expenses include Registration fee, examination fee, tuitions fee, other fee like donation, consolidated education charges, payment for private tuition, payment for food at school, transportation charges, accommodation fee, other equipment (laptop), and other expenditure like uniforms, books, and stationary.

Table 1.1: Description of Variables

Variables		Description
<i>Dependent Variables</i>		
Mathematics Test Score		Raw test score on the Mathematics by YL child during the survey out of 30 marks
English Test Score		Raw test score on the English by YL child during the survey out of 30 marks
<i>Explanatory Variables</i>		
Child Specific Features	Gender	= 1 if male, 0 female
	Time to Study	How many hours a child spent studying apart from school hours
	Body Mass Index	The proportion of weight (in kg) and squared height (in meters) of YL child
	Years of Education	Years of schooling child has received at the time of the survey
	SC	= 1 if SC, 0 otherwise
	ST	= 1 if ST, 0 otherwise
	OBC	= 1 if OBC, 0 otherwise
	Availability of Fellowship	Whether a child is getting any fellowship or not. =1 if yes, 0 otherwise
Parental Education	Mother's Education	No. of years child's mother' education
	Father's Education	No. of years child's father's education
Household Features	Expenditure	Total amount spent in the last academic year by family on education (in Rupees).
	Household size	No. of members in a family
	Assets	Total of five most valuable assets owned by household (in Rupees).
	Availability of computer	Presence of a computer at home for educational purpose. = 1 if available, 0 otherwise

1.10 An Overview of Primary Field Site: Andhra Pradesh and Telangana

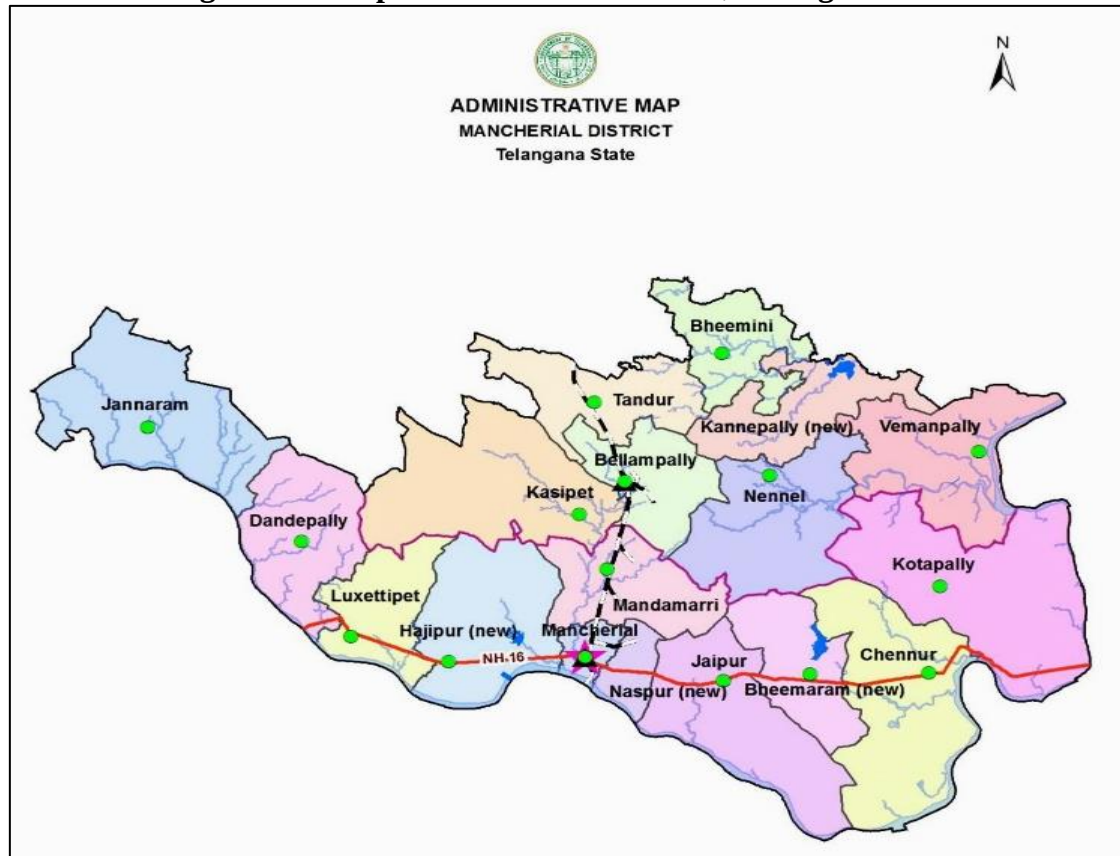
The objective of the study is also to analyze the gender gap in educational performance among the marginalized groups. Since the study has used the secondary data from YLS which was collected in erstwhile Andhra Pradesh. Therefore, to maintain the same population, the study has used non- probability sampling method in which we followed convenience sampling/judgmental or purposive sampling method. Hence, Telangana and Andhra Pradesh have been selected for the primary survey⁶.

1.10.1 District Profile Selected for the Primary Survey

The objective of the study is to analyze the gender gap in educational performance among marginalized groups. The district with the highest SC population is been selected for the primary survey. Telangana state has 33 districts, out of which Hyderabad (6.29 percent) and Medchal (9.36 percent) has the lowest SC population in the state. However, Mancheri, Jangaon, and Nagar Kurnool have the highest SC population in the state. Mancheri is the district that has the highest proportion of the SC population which is 24.72 percent (Government of Telangana, 2021). The district has 64.35 percent literacy rate, 72.96 percent for male and 55.59 percent for female. Almost half of the female population is illiterate (Government of Telangana, 2021). Overall sex ratio of the district is 977 and for SC and ST sex ratio is 979 and 972 respectively. Mancheri has total 1010 schools, out which 594 primary, 179 upper primary and 289 high schools. The district also has 17 hostels for SC students, 18 for ST and 14 for BC students.

⁶ In 2014, the state of Andhra Pradesh was bifurcated into two separate states: Telangana and Andhra Pradesh.

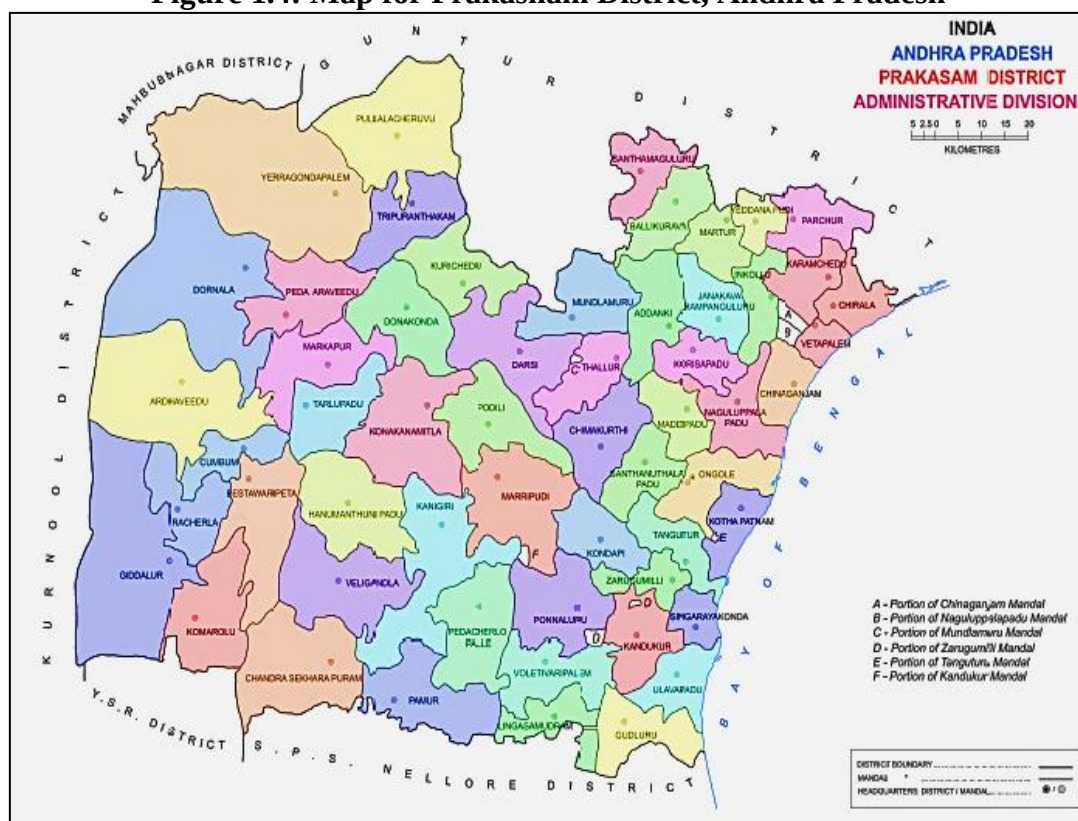
Figure 1.3: Map for Mancherial District, Telangana State



Source: Planning Department, Government of Telangana, 2016

Andhra Pradesh has 16 districts. As per the Government of Andhra Pradesh (2021), districts Visakhapatnam and Srikakulam have the lowest proportion of SC population. On the other hand, Prakasham and Nellore have the highest proportion of SC population in the state. Prakasham district has been selected for the primary field survey because it has the highest proportion of the SC population equal to 23.19 percent. The district stands 4th in terms of area. Sex ratio for the district is 981. 63.08 percent of the population in the district is literate. 72.92 percent of the males and 53.11 percent of the females are literate. The data shows that almost half of the females are still illiterate in the district.

Figure 1.4: Map for Prakasham District, Andhra Pradesh



Source: District Census Handbook, Prakasham, Government of Andhra Pradesh, 2011

1.10.2 Demographic Profile of the Mandals Selected for Primary Survey

The Mancherial district of Telangana consist of 18 revenue mandals with 2 revenue divisions. The district has 382 villages. Mandal Jaipur and Chennur have highest proportion of SC population in the district (Census, 2011). Hence, Jaipur and Chennur are being selected for the primary survey.

The district Prakasham of the state of Andhra Pradesh has 56 mandals with 1086 villages. In Prakasham district, Tangutur and Maddipadu mandals have highest proportion of the SC population in the district (Census, 2011). Thus, Tangutur and Maddipadu mandals are being selected for the primary survey. The demographic Profile of the Selected Mandals is presented in Table 1.2

Table 1.2: Demographic Profile of the Selected Mandals

	Mancherial District		Prakasham District	
	Jaipur	Chennur	Tangutur	Maddipadu
No. of Villages	35	34	17	20
No. of Households	13,342	14,225	16,290	14,130
Sex Ratio	989	1,004	1,009	1,002
Total Population	50079	54,692	62,618	52,353
Male Population	25183	27,286	31,172	26,155
Female Population	24896	27,406	31,446	26,198
Literacy rate	53.84	53.86	59.94	58.04
Literacy rate for male	31.01	30.57	33.77	33.04
Literacy rate for female	22.83	23.28	26.17	25.04
Total Workers Percentage	47.69	47.95	52.66	53.73
Total Male workers percentage	27.22	27.57	30.11	30.34
Total Female workers percentage	20.47	20.37	22.55	23.39
Total Agriculture Farmers percentage	5.54	8.69	6.14	5.91
Male Agriculture Farmers percentage	4.38	6.79	4.85	4.45
Female Agriculture Farmers percentage	1.16	1.90	1.29	1.45
Labor Percentage	16.68	18.73	28.58	31.84
Male Labor Percentage	8.43	8.59	14.04	14.64
Female Labor Percentage	8.25	10.14	14.54	17.20

Source: Census, 2011

1.11 Problem faced during the Field Survey

The selection of the field and conducting a field survey to collect primary data was not an easy task. There were many problems that emerged in the field such as language barrier and non-cooperation by the people of the villages. Since the questionnaire was lengthy, respondents were taking long time to complete the interview (50 mins on an average). During the field survey, non-cooperation from the upper class people made me realise that collecting data from them is not easy, in fact, many parents didn't allow to talk to their children and they also behaved rudely. Parents were hesitant about revealing their income and value of household

assets. On the other side, lower class and caste people were happy to participate in the survey and were very cooperative.

1.12 Methods and Tools of Analysis

As analysing tools, descriptive statistics, cross-tabulations, regression analyses, T-tests, Blinder-Oaxaca decompositions, graphs, charts, etc. are used. Statistical packages such as Stata, SPSS, and Excel have been used for the estimation, graphing, and the tabulation of the data. In addition, frequency table, bar diagrams, and cross-tabulations were used in the study.

1.13 Theoretical Framework

The students' educational performance (test score) depends on many factors and a performance relationship can be used to represent/illustrate it. These relationships may be extremely adaptable, allowing for almost any learning process. Even if a production function for education exists, there is no certainty that it can be estimated.

A simple production function is used to represent the relationship between Educational Performance (P) and the set of variables which works as an input to the production process. Most influencing input variables are parental education (PE), Child specific feature (C), and Family or household characteristics (H) followed by (Arteaga and Glewwe, 2014):

$$P = f(PE, C, H) \quad \dots (1.1)$$

The first task is to assess the performance production function written in equation (1.1). Above production function shows how each factor such as gender, age, family income, social background of the child, and availability of computer at home, availability of educational objects such as books, notebook, space to study etc., maternal educational qualification etc., affects educational performance keeping other factors constant.

Analyzing an educational performance production function is not easy task. One way is to implement linear regression methods to a linear approximation of equation (1.1). The below linear specification shows each variable in the vectors PE, C and H explicitly:

$$P = \alpha + \beta_1 PE + \beta_2 C + \beta_3 H \quad \dots (1.2)$$

Where, P is educational performance, PE is parental education, C is child specific features, and H is household characteristics.

We have used above mentioned simple linear regression method to analyze according to our objectives. α , β_1 , β_2 , and β_3 are the parameters of the educational performance model. The α is an intercept term which gives us the average value of P when PE, C, and H are taken to be zero and it has generally no economic meaning. β_1 , β_2 , and β_3 are partial regression coefficient or slope coefficients and shows the rate of change of conditional values of P per unit change in PE, C, and H respectively ceteris paribus. Now, variables on the left side are dependent variable and variables on the rights side are independent or explanatory variables. Hence, in educational performance model performance is dependent variable and parental education, child specific features and household characteristics are explanatory variables. Generally, relationships between variables are not exact therefore to considered inexact relationship between variables; educational performance model can be written as:

$$P = \alpha + \beta_1 PE + \beta_2 C + \beta_3 H + \varepsilon \quad \dots (1.3)$$

Where, ε is disturbance or error term which is stochastic variable.

β_1 is a slope or row vector of coefficient of influence of the parental education on YL children's test score on mathematics. The parental education variable is the column vector of 'parental education variables' presented in the table. The product of the row vector i.e., β_1 and column vector i.e., 'parental education variables' show us the sum of the total influence of the parental education variables on educational performance of YL children. The β_2 is slope or row vector of coefficient of influence of the child-specific feature on YL children's test score on mathematics. The child specific feature is a column vector of the 'child specific feature' mentioned in table. The product of the row vector i.e., β_2 and column vector i.e., 'child specific features' gives us the sum of total influence of the child specific feature variables on educational performance of YL children. The β_3 is slope or row vector of coefficient of influence of the household characteristics on test score of mathematics of YL children. The household characteristics is a column vector of the 'household characteristics' explained in table. The product of row vector i.e., β_3 and column vector i.e., 'household characteristics' show us the sum of total influence of the household variables on educational performance of YL children.

The error term in our model is represented by ε in equation (1.3). It takes into consideration the measurement of error in P and for the deviations of linear equation in equation (1.2) from the general non-linear function in equation (1.1).

The coefficients (β_1 , β_2 and β_3), influence of the observed variables on performance, can be estimated by OLS if and only if the error term (ε) is uncorrelated with all of the observed variables (PE, C and H).

1.14 Blinder Oaxaca Decomposition: An Empirical Framework

As per the objectives, the study also measures the extent to which background factors contributing to gender gap in educational performance. Thus, it has adopted the Blinder-Oaxaca decomposition methodology. There are two subsets of samples in the study, the Male (M) and Female (F), outcome variable performance (P), and a set of predictors (explanatory variables). The difference between the expected values or average values of these subsets can be determined using the following equation,

$$R = E(P_M) - E(P_F)$$

Where,

$E(P_M)$ means the expected values of the outcome variable for males, which is accounted for by group difference in the predictor. $E(P_F)$ refers the expected values of the outcome variable for females, which is accounted for by group difference in the predictor.

Based on the linear model

$$Y_i = X_i' \beta_i + \varepsilon_i \quad , \quad E(\varepsilon_i) = 0, \quad i \in (M, F)$$

Where X is a vector containing explanatory variables and a constant, ε is error, and the mean outcome difference can be expressed as the difference in the linear prediction at the group specific mean of the regression that is:

$$\begin{aligned} R &= E(P_M) - E(P_F) \\ &= E(X_M)' \beta_M - E(X_F)' \beta_F \quad \dots(1.4) \\ \because E(P_i) &= E(X_i' \beta_i + \varepsilon_i) \\ &= E(X_i' \beta_i) + E(\varepsilon_i) = E(X_i)' \beta_i \end{aligned}$$

Where $E(\beta_i) = \beta_i$ and $E(\varepsilon_i) = 0$ by assumption.

To determine how group differences in predictors contribute to overall outcome differences, (1.4) can be rearranged following Blinder (1973), Oaxaca (1973), and Jann (2008).

$$R = \{E(X_M) - E(X_F)\}'\beta_F + E(X_F)'(\beta_M - \beta_F) + \{E(X_M) - E(X_F)\}'(\beta_M - \beta_F) \quad \dots(1.5)$$

Above equation (1.5) is a “threefold” decomposition, that is, the outcome difference is divided into three components,

$$R = E + C + I$$

The first component,

$$E = \{E(X_M) - E(X_F)\}'\beta_F$$

amounts to the part of the differential due to group differences in the predictors (the “*endowments effects*”). In other words, $\{E(X_M) - E(X_F)\}'\beta_F$ measures how much of the test score gap occurred due to the difference in the background characteristics (child and household) of male and female children, that apply to the impact of a female child β_F .

The second component,

$$C = E(X_F)'(\beta_M - \beta_F)$$

measures the contribution of differences in the coefficient (including differences in the intercept). In our analysis $E(X_F)'(\beta_M - \beta_F)$, indicates how much of the test score gap is due to the difference in the variation of mean outcome of male and female children. Applied to the impact of a female child $E(X_F)'$.

And the third component,

$$I = \{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$$

is an interaction term measures the fact that differences in endowments and coefficient exist simultaneously between the two groups. In other words, the third term, $\{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$ measures the contribution to the performance gap of difference between male and female students in the impact of background characteristics on performance, applied to the difference in the average characteristics of male and female students $\{E(X_M) - E(X_F)\}$.

The decomposition equation (1.5) is derived from the perspective of Group F. The group difference in the predictors is laden by the coefficients of Group F to analyse the endowments effect (E). The E calculates the expected variation in Group F's mean outcome if Group F had

Group M's predictor levels. Correspondingly, for the C, the dissimilarities in coefficients are laden by Group F's predictor levels. That is, the C component tests the expected variation in Group F's mean outcome if Group F had Group M's coefficients.

1.15 Tests

In this section of the chapter study discuss the tests which has been done to check the validity of the regression method. It discuss test for multicollinearity, study used VIF test to check the presence of multicollinearity. Study has utilized the BP test to check the presence of heteroscedasticity in the model. At the last it discuss no parametric t-test.

1.15.1 Test for Multicollinearity

In our analysis OLS regression has been used therefore, it becomes imperative for the dataset to satisfy the OLS assumption. The speed at which variance and co-variances change is known as Variance Inflating Factor (VIF). The VIF shows how the variance of estimators is inflated by the presence of multicollinearity. In order to trace the presence of multicollinearity in our dataset, VIF test has been used in the analysis. In other words, the presence of multicollinearity can be traced by VIF. When two or more explanatory variables have exact linear relationship between them then we have perfect multicollinearity if there is no collinearity between explanatory variables, the value of VIF will be one, however, if collinearity between explanatory variables increases, the value of VIF will also increase, and it can reach to infinity. If the value of VIF for all the explanatory variables are less than five it means the multicollinearity is non-existent.

1.15.2 Test for Heteroscedasticity

According to the Classical Linear Regression Model (CLRM) assumption, the error term is homoscedastic or has equal variance. If the assumption is not fulfilled, we have a circumstance of heteroscedasticity i.e.

$$Var(u_i) = E(u_i^2) = \sigma_i^2, i = 1, 2, 3, \dots, n$$

In cross sectional data, the problem of heteroscedasticity is likely to be more typical than that of time series data. We have utilized the Bressch-Pagan test to check the presence of heteroscedasticity.

An attempt was made to check the presence of heteroscedasticity. The OLS regression must satisfy the assumption of Heteroscedasticity i.e., the residuals and in depended variables are not related. In order to check the trace of heteroscedasticity, the BP test has been used in the model. The square of the BP test helped in deduction of the estimated model and further facilitated in the evaluation of the residual followed by evaluation of the square of the residual. Finally, the square of the residual was regressed on explanatory variables. If the null hypothesis of homoscedasticity is not rejected, it means that the model does not fit or it can also be concluded that residual square is unrelated to the explanatory variables.

1.15.3 T-Test

The t-test is a type of inferential statistic used to determine whether one group's means are significantly different from those of another group, which may be related in certain ways. T-tests are used to test hypothesis, which enables us to test a population assumption. The t-test determines the degree of significance by examining the t-statistic, the t-distribution values, and the degrees of freedom.

1.16 Limitations of Study

In this segment of the chapter study explains the limitation of the study. As a particular set of data of YLS for India has been analysed to measure the gender gap in educational performance and brings out the factors which are responsible for this gender gap. By analysing these factors, we can help bridge or reduce the gender gap especially with regard to the performance by the female child in Mathematics and English. Hence, the study cannot be generalised for other states of the country.

1.17 Chapter Schemes

The thesis is divided into seven chapters.

The First chapter: Introduction, deals with introduction, the education as constitutional rights, an overview of central governments educational schemes, Research gap and contribution of the study, major issues from the literature, research questions and objectives of the study. Chapter explains the primary and secondary data sources, study design, sample size, and primary data collection, variables, an overview of primary field site, problem faced during the field survey. This chapter also has discussion on the theoretical framework, Blinder Oaxaca decomposition, and the various test used in study and limitations of the study.

Second chapter devoted towards issue wise literature review on educational performance and child specific features, parental educational and involvement, household characteristics, type of school, and other feature and educational performance.

Third chapter focus on analysis of gender gap in educational performance in united Andhra Pradesh and bring out the factors causing and extent to which these factors are contributing to the gender gap, using the Blinder-Oaxaca decomposition.

Fourth chapter discuss the gender gap in academic performance in public and private schools: an analysis of Young Lives survey for India. Chapter also factors determining educational performance in public and private schools. It also measure the gender based mean difference of the background features and using the B-O decomposition analysis the factors responsible and contributing to the gender gap in public and private school.

Fifth chapter discuss the need of the primary survey, find the factors determine the performance of the children, and measures the gender gap in educational performance among marginalised groups in Mancherial and Prakasham districts using the micro level analysis.

Sixth chapter unveiling gender gap in educational performance between Andhra Pradesh and Telangana: Evidence from a primary study, explain the relationship between educational performance and various background features of the children. It also analyse the factors influencing educational performance and using the B-O, it bring out the factors contributing to the gender gap in educational performance in Telangana and Andhra Pradesh

Seventh chapter conclusion: summary and policy implications: focus on the major finding of the research, policy pointer, and future scope for the research.

The study has conducted the field survey in two districts of Andhra Pradesh and Telangana. Therefore, the study cannot be generalised for other states of the country.

CHAPTER-II

Review of Literature

“Strengthen the female mind by enlarging it, and there will be an end to blind obedience.”

-Mary Wollstonecraft

2.1 Introduction

The chapter discusses the review of literature concerning educational performance. There has been vast literature which talks about various factors such as gender, socioeconomic status, years of education, health of the child, time spent on study, parental education (mother and father’s education) and their involvement in school activities of the child, household wealth, family income, expenditure on education, availability of computer and fellowship, access to mid-day meal, type of school, etc. and their influence on educational performance. It includes the literature which shows the effect of above-mentioned background characteristics on the gender gap in educational performance. We begin with gender discrimination against women and reasons for it. The study then categorises review of literature into five major themes – child-specific features, parental education and involvement, household characteristics, type of school and other features.

Gender discrimination is a social reality for the girl child right from her birth. An inherent bias against the girl child continues to manifest in various forms throughout her life as a woman. This is evident from various data exhibiting the rate of female foeticides and infanticides, the ratio of working women as compared to working men, the wage gap, etc. Even in terms of education, female children are often at a disadvantage with respect to receiving it on the one hand and being able to complete the same on the other. In a country that constitutionally provides legal rights, protection as well as provisions that aim to encourage those who are disadvantaged and marginalised, the societal norms and values still revolve around a male-driven society. Spaces that muster equal opportunities and access are often less in number and if so, inaccessible to those at the periphery.

2.2 Discrimination against Women

Various studies have come forth regarding the discrimination faced by women in different spheres. Differentiating between the sexes and assigning gender roles to them is considered normal in most families. Needless to say, the initial experiences of discrimination start from family, which is further carried forward to schools as well as to work environments. Starting from teaching girls to be submissive to the opposite gender, to expecting them to sacrifice their goals, education and jobs for the sake of ‘family’, the levels and degrees of discrimination are different across societies.

Kumar (2008) discussed gender discrimination and the many forms and variables that contribute to it. He also emphasised the significance of women in the development process, advocating for women's legal rights and remedies to gender inequality. Women face prejudice from the time they are born until they die. This is a type of prejudice that is increasingly widespread in everyday life: elimination of girls during at pre-natal stage, girl infanticide, discrimination in accessing schools, discrimination in access to health services, marriage at a tender age, social prejudices against girls, evil practices like dowry, domestic violence, unreal stereotypes and divorce. Reasons for gender favouritism are: low literacy in women, caste and social hierarchy, traditions, values, mores and norms, races, low income, etc. The E4SD (Education, Employment, Empowerment, Economic Independence, Self-confidence, and Decision Making) characteristics, according to Kumar, can overcome gender discrimination issues.

In India, Sen and Kumar (2001) discovered that a girl child is discriminated in many ways, including short breastfeeding periods, less attention to girl's nurturing, less care or medical treatment during illness, lack of nutritious food, and lack of parental attention to the girl child, all of which make them more prone to infections and diseases, resulting in ill health and a higher mortality rate than their male counterparts. This prejudice is intergenerational, and it is the cause of infanticide and foeticide, which may appear silent but are louder than crimes. According to the Planning Commission of India (2008), discrimination against women and girls begins with the right to health and manifests itself in low health and nutrition indices. Despite this, India continues to have catastrophic MMR and IMR rates, as well as high rates of anaemia, malnutrition, and HIV/AIDS diagnoses among women.

2.3 Reasons behind Gender Discrimination and Way Forward

Gender discrimination is very prominent in the society and so are the reasons that lead to it. Women are considered weak, second-grade citizens, and incapable of running families on their own. This has rather been a cultural assertion that has been followed by most cultures; women are seen as secondary to men. Men are supposed to take the lead in family matters as well as in public sphere because they are considered the dominant sex. With these inherent beliefs, it is only natural that any attempt from the side of women to question the system or deviate from such norms receive contempt.

According to Lind (2006), a large portion of India's population lives in rural culture, where customs and religious laws control people's lives, and this is especially true for women. Women sometimes have the right to own property, but societal and religious conventions prevent them from exercising it for the sake of family harmony. In all communities, the value of a son in the family is emphasised, and this desire for having a boy kid reduces girls to second-class members in their own families.

In an attempt to understand the way forward for women in higher education, Chanana (2000) asks, "What are the implications once they enter higher education?" "How are their possibilities of survival and progression?" "How do they make disciplinary decisions and what are their choices' trends?" The answers to these questions could form a whole new set of research possibilities. In a changing world, with women being more assertive of their rights and positions, it could, in fact, provide a fresh insight.

Barriers to entry

Various factors act as impediments for the girl child in higher education. The major factor is the question of accessibility. Other issues include outdated curriculum (the introduction of subjects and disciplines in educational institutions with the assumption that only men will attend), physical facilities, gender stereotyping in sports facilities (girl students are not allowed or discouraged from playing or participating in sports), and career options. These factors cause a number of issues, including the lack of suitable facilities for female students, such as restrooms, hostels, scholarships and fields of their choosing, the absence of female professors or separate schools and colleges for women, and a lack of counselling for students and career alternatives. At the micro and macro levels, there are two sets of socio-cultural aspects to

consider. The macro-level dimension is linked to caste, tribe, class, and geographical differences. Institutional and sociocultural elements are further subdivided at the micro-level. Institutional reasons such as gender stereotyping in course content and topic selections, teachers' and administrators' discriminatory attitudes, the lack of role models for career options and academic leadership at the college and university levels, and so on. Lack of economic resources in the family, the decision between dowry and educational fees, the perception of education as consumption rather than production, and the absence of role models at home are all societal issues that impact the girl child's access to higher education. Singh and Mukherjee (2015), utilizing the Young Lives study panel data about child poverty, studied the factors affecting the completion of secondary education in Andhra Pradesh (before it was divided into Andhra Pradesh and Telangana). Such factors were barriers, especially for girls to complete their secondary education. This is suggestive of the fact that the educational policy need to be revisited in order to ensure access to quality education from pre-school for all children, particularly for those from rural areas. It is also important to make sure that children are not withdrawn from school to get into paid work as it affects their long-term education and, in this case, the completion of secondary schooling.

2.4 Childhood Characteristics and Educational Performance

In learning about the gender gap in educational performance, it is important recognise the aspects that affect it. While the gender of the children is a major factor that affects academic achievements, aspects such as BMI, social background, years of education, etc. matter in a concrete analysis for realising various nuances attached to it. Various scholars have studied these factors extensively and contended that these factors largely influence schooling and performance in education by male and female children.

Multiple scholars have collected data on academic performances, with a focus on Mathematics, in order form a better understanding of the gender disparities and various other aspects that add to differences among students in different countries. In a study, Rodríguez *et. al.* (2020) used a sample of a total of 897 pupils in the 5th and 6th grades (450 boys and 447 girls), the findings of which support prior studies indicating that girl have lesser favourable views about Mathematics than their male classmates, with lower motivation, poorer perceptions of ability, and higher rates of anxiety, but the impact sizes were minor in all situations.

There have been studies that used the Young Lives data to show the impact of gender on educational performance. Singh and Krutikova (2017), with the help of the unique data from Young Lives panels in Ethiopia, India, Peru and Vietnam, investigated gender gaps among 3 to 19 years old based on various cognitive skills and found that in all four countries, gender gaps in performance was insignificant before school entry (at age 5) and when the children entered primary school (8 years). As the children reached secondary school, the gaps widened especially between the ages of 12 and 15 years. In Ethiopia, India, and Peru, boys have an edge over girls, however in Vietnam, girls have an advantage. Models including panel-based, value-added factors, such as prior accomplishment, child health, time usage, parental education, and school quality, can explain half to two-thirds of the cross-sectional gender disparity in scores at 15 years old. Dickerson *et al.* (2015) investigated the gender differences in Mathematics exam results among primary school pupils using data from 19 African nations. The study found that there is a considerable difference in Math exam scores; there is a trend favouring males, which is comparable to earlier research in developed nations. However, this distinction does not account for gender differences in quality of schools, home environment, or access to learning inputs inside schools. The gender gap varies from region to region, and regional features are determinants of the gender gap more than education of parents and characteristics of school, including gender of teachers. The prevailing point of view in the field is that male children surpass female children's performance irrespective of the type of school. (Kingdon, 1996), and White *et al.* (2016), found that in India that girls did worse in reading and mathematics than boys. These facts are further proven by Fryer *et al.* (2010) using a large and nationally representative panel of US youth and investigating the establishment of a significant gender gap in Mathematics in the early years of education. The existence of a gender Math gap is documented at every stratum of society, according to research. Even in a study on rural Pakistan, Alderman *et al.* (1996) found that the availability of local school accounts for nearly a third of the overall cognitive achievement gender difference and more than two-fifths of the numeracy gap, implying that policies that boost local school availability for girls might lessen the size of the cognitive skill gap. In contrast to the above-mentioned studies, females outperform males (Farooq *et al.*, 2011) in Pakistan.

However, the mixed findings imply that several factors influence the gender gap in educational performance. In their study, Azubuike and Little (2019) examine learning outcomes and motivations for boys and girls in Grade 10 in Vietnam using data from the 2016-17 Young Lives school survey. It investigates how variations in learning motivations affect learning

results and expectations in the future, as well as the causes of these differences and their interactions with the student's background and past learning achievement. Despite the fact that girls perform better in Mathematics on average, they have poor confidence in their ability. Boys are more confident in their Mathematical skills than girls. The study by Bharadwaj *et. al.* (2016) on several countries using data from the PISA 2006 and 2009 too, tried to investigate the gender gap in Math. The study illustrated a similar influence of factors as that of others, such as parents (their backgrounds and investment behaviour), general atmosphere in classrooms that involved teacher's gender and composition of the class, and specific qualities of each student. The results do not take into account a large portion of such a gap due to any of these characteristics. Similarly, results indicated that means of controlling within school as well as class, contribute seldom to the gender gap, suggesting that sorting across class and schools does not cause the gap.

Breda and Napp (2019) tried to bring forth much more reasoning to the issue, and argued that in developed countries, gender differences in performance in Mathematics are comparatively less at present, and they cannot elucidate the disproportionate number of women in Mathematics alone. However, with regard to gender differences in reading ability, the latter conclusion is no longer true. According to an individual-level data on 300,000 15-year-old students, the difference between reading and Math performance is 80% greater for girls than for boys, which is an extremely large difference. These results suggest that women's relative advantage in Math over reading at the time of choosing their educational paths contributes to their underrepresentation in Math-intensive fields.

While these studies focussed on explaining gender disparities in academic performances on a math-based analysis, Demirbas and Demirkan (2007), with the help of Experiential Learning Theory (ELT) investigated the impact of learning techniques and gender on the academic scores of freshman design students in Turkey throughout three academic years. Although there is no consistency among the three groups, the data indicated that males scored better in technology-based courses, while females scored better in artistic and foundational courses, as well as in semester academic achievement ratings (GPA). Jelas and Dahan (2010) found that girls outperformed males in practically all school courses. On a positive note, the ratio of female students enrolling at university levels has climbed from 50 in 1996 to 56 in 1999. It has been shown that females do better on long-term activities that need them to memorise abstract,

unambiguous facts and rules, but boys respond better to open-ended projects that require them to think for themselves and are tied to practical and actual circumstances.

Socioeconomic backgrounds of the students have a major role in determining their performance in academics. Thomson (2018) put forth the argument that students from low socioeconomic households are at a disadvantage in school. There seems to be a lack of academic environment at home for students in these households that in turn affects their overall academic achievements. In comparison with parents with low socioeconomic status, those belonging to the higher status are better equipped in providing financial support as well as developing resources within their homes for the benefit of their children. The availability of books at home, in particular, has been proven to be a major advantage towards student achievements, as per several large-scale international studies over the years. Parents from a higher socioeconomic status are capable of offering their children more psychological support by ensuring conditions that facilitate the development of abilities required for academic purposes as well as create a positive environment in their homes to encourage the cognitive development of their children. Another topic of study is the impact of socioeconomic background on success at the school level. Although one aspect could be that of lower levels of resourcing (physical and educational), other less visible aspects include lower teacher and parent expectations, as well as lower level of student self-efficacy, enjoyment, and other non-cognitive outcomes. There is also evidence that pupils from lower socioeconomic backgrounds have lesser opportunities to study (especially in mathematics), with “systematically inadequate content supplied to lower-outcome students.”

A major advantage for the students who belong to higher socioeconomic backgrounds is that their parents are capable of providing them with a conducive social environment for learning. As per many studies, parents with higher educational qualifications and economic statuses tend to invest in their children’s schooling and education, while the study of Hauser and Featherman (1978) pointed out that children from lower socioeconomic backgrounds are at much disadvantage in this regard (qtd. in Stevenson and Baker, 1987). A study conducted by Farooq and et.al, 2011 to determine the various factors which influence the academic performance of secondary school students of the metropolitan city of Pakistan found that socioeconomic status and education of parents are significant factors that affect the overall academic achievements of the students as well as their performance in subjects like Mathematics and English. The information was collected from six hundred (300 male and 300 female) students of 10th grads

through a structured questionnaire, and details about their academic performance was gathered from the annual examination of class 9th grade. Econometric t-test and ANOVA methods were utilised to analyse the impact of various factors on academic achievements. The high and average socioeconomic status influence the performance more than the lower status. Parental education, therefore, is an added advantage to their children's academic performance.

Similarly, a study done by Considine and Zappala (2002) to understand the impact of factors such as socioeconomic, family and individual backgrounds on the school educational performance of 3000 select students from a financially disadvantaged background found that the social as well as economic conditions of socioeconomic status had an explicit and separate impact on their educational outcomes. By means of the binomial logistic regression method, he found that sex, parental educational attainment, unexplained non-attendance, housing type, ethnicity, and age are noteworthy factors and indicators of academic performance. The study was of the opinion that in order to help develop students from financially impeded families, financial assistance was a critical factor that could be allocated through projects aiming at uplifting the conditions of such families and schools. Mercy and Steelman (1982), in their study, analysed the link between socioeconomic status and child's ability through family structure and child's experience at home. Using the data from the National Health Examination Survey, the study, with the help of LISREL technique, compared the verbal and non-verbal capacity of children between the 6-11 age group. It showed that the impact of socioeconomic status on ability is transmitted by the child's environment. It also found that the time spent with friends was adversely related to the IQ performance of the children and in addition, their intellectual development would lessen if they engaged constantly with the same group and did not collaborate with adults or different intellectual age groups.

The fact that parents from different social and economic classes have unequal resources to adhere to the teachers' requests for participation of parents was asserted by Lareau (1987) in a qualitative study on school-family relationships among the white working-class and middle-class communities. The study found that schools had a conceived notion on the role of parents in schooling; that family life characteristics (such as social networks) also interfered with family-school relationships. According to the findings, the concept of cultural capital ("the social and cultural aspect of life that encourage cooperation with instructors' requests") can be useful in understanding social class inequalities in experiences of children at school. PISA data shows that on average among OECD nations, differences in students' socioeconomic,

demographic, and educational backgrounds account for 15% of the variation in low performance. A girl student raised by a single-parent, with the same socioeconomic status, immigrant background, speaks a different language at home than at school, lives in a rural area, did not attend pre-primary school, repeated a grade, and attends a vocational track has a 76 per cent possibility of performing poorly on average across OECD countries.⁷ Chung (2015) elaborates the many risk factors associated with SES that influence children's readiness to attend school and, as a result, their cognitive, literacy, and numeracy development, as well as their physical and emotional well-being. Low child health, poor education of mothers, increased maternal stress, poor support from parents and school, and insufficient stimulation in the home and school environments are all risk factors that have a negative effect on their development and achievement. It concludes that a child's academic performance is influenced by the characteristics of their family's socioeconomic status.

Stumm's (2017) study was able to establish that SES was positively related to academic performance at age 7 and achievements in academic performance or growth from age 7 to 16. In Ojima and Below's (2009) Germany's and Japan's PISA 2003 statistics, it was found that in Germany, the link between socioeconomic class and arithmetic performance is greater than in Japan. Socioeconomic position influences the grades of students which in turn elucidates their performance in Maths, in spite of elements such as gender and school, typed being controlled. Consequently, the system of retention served as an additional link between social position and academic success. It was also found that the role of mothers was crucial in enhancing the academic success of the children in both countries. The regression analysis revealed that anxiety and unfavourable attitudes toward Mathematics were associated with poor performance. Even though quality in parenting and health of the child are linked to test performance, these account for a portion, but not the majority of the relationship between SES and cognitive development. Ratshivhanda and Guvuriro (2018) asserted that there was an inter-generational impact of parental SES positively that affected a child's educational achievement in South Africa, by using descriptive statistics and OLS regressions.

Besides the family background and socio-economic factors, the child's health, years of schooling, and time spent on studies apart from schooling hours are also significant attributes that cannot be ignored while studying the children's educational performance. A child's health

⁷ OECD (2016), *Low-Performing Students: Why They Fall Behind and How To Help Them Succeed*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/9789264250246-en>.

is an essential factor causing a gap in Mathematics and vocabulary (Arteaga and Glewwe, 2014). In line with this, Maddah *et al.*, (2003) inferred that those women with advanced education levels had lower mean BMI compared to less educated women and results indicated turnaround examples for the men. According to the authors, Iranian women, as women in other developed nations, the educational level was inversely related to BMI, while in men the connection tended to be positive. Hermann *et al.*, (2011) argued that there is an inverse connection between education level with BMI and WC (waist circumference) in the European cohort. They were of the opinion that public health programs that intend to lessen overweight and obesity ought to be fundamentally centred on the lower educated populace.

Performance of the children is also a function of the time devoted towards studying apart from the time spent in school. Grave (2011) demonstrated the association between time allocation to study and academic performance by using the information on students at German universities between 1986 and 2006. Their findings indicated that time devoted to self-study is related to grades. Kingdon (1996) has done a case study of Uttar Pradesh on the quality and efficacy of private and public education in urban areas that aimed to understand the time-factor as well. The author analysed the impact of various factors on academic performance and asserted that the time spent on studies at home had a positive implication on the academic performance of the children. As per Kapur (2018), the elements that influence academic achievements of students in India's secondary schools included provisions of tuition, financial background of the family, the environment at home, needs of the family members (family size) etc. , at the same time suggesting that time spent on homework or tuition correlated with higher reading and Math results. Unfortunately, inconsistent data on rural/urban status give less insight into this component than desired. Finally, it has been discovered that attitudes supportive of female education boost girls' reading achievement. Heady (2003) demonstrates that a major aspect that affected academic performance was working outside the home. They validate conventional wisdom in addition to offering a new perspective on how it originates. It is not via school attendance that a large portion of it is derived. The direct relationship may arise as a result of exhaustion or a shift in focus away from academic issues.

Years of schooling also determine the child's performance and cause a difference in educational performance between both the genders. A study using the Young Lives data for India shows that years of schooling and time spent on studies significantly influence mathematics performance (Nagi and Sridevi, 2020). Another study also documented by Tafere

and Agazi (2020) that talks about the educational journeys of Ethiopian young people. It draws on the survey and qualitative data from earlier rounds as well as data from the Young Lives fifth-wave qualitative research in five Ethiopian study communities, which was conducted in 2019. According to the findings, children have had a difficult time progressing through school. Rural students and students from poor families had more disturbed educational trajectories, with the majority of them being over-age for their grade levels. The rate of progression through school made little difference by gender. The study found a clear link between school progress and achievement, with those who progressed through the levels maintaining high educational aspirations and vice versa. Longer schooling meant that even as adults, young people were sometimes still in school.

Paxson and Schady (2007) with a sample of more than 3,000 exclusively poor preschool-aged children from Ecuador evaluated the determinants of their results on a widely recognised language ability test. The study brought to the fore other factors like parental education and household wealth and it discovered that greater scores are connected with higher household wealth and parental education and that these correlations are stronger among older children.

2.5 Parental Education, Involvement and Educational Performance

As discussed in the previous section, the education of parents plays an important role in shaping the attitudes as well as achievements of children in academics. Research has shown that educational background of parents in addition to their involvement and behaviour significantly affect children's educational performance. Parents with higher levels of education have the potential to direct a better path for education and its prospects than parents with lower levels of education. Due to their exposure to large opportunities, children with educationally qualified parents, often find themselves at an advantage in grasping varieties of openings easier, in addition to ease in access.

Parental education status is related to a child's learning and performance in school (Kohn, 1969; Marjoribanks, 1979). Heyns (1978) said that parental educational levels predict more about variance in child's school achievements than any other family background, especially if the child is younger. (Stevenson and Baker, 1987) They, in a paper "The family-school relation and the child's school performance", tried to find the link between parental involvement in schooling and the performance of a child. They have analysed cross-sectional data and found that the level of mother educational qualification is directly related to the level of parents'

involvement in a child's schooling. Hence, parents with more education are more involved. A child's school performance depends on parents' involvement. Parents get more involved in school activities if the child is younger. The main indicators to analyse parents' involvement in schooling for girls and boys are the mother's education level and the age of the child. Zhan (2006) found that mother's education is positively related to children's educational performance and their expectations and involvement in school activities.

The Young Lives survey report, 2017 and a study (Alwani, 2018) on India have shown that maternal education emerged as the most significant factor of the Mathematics test scores of children. In addition to this, another finding from four low and middle-income countries (India, Ethiopia, Peru and Vietnam) by Crookston *et. al.* (2014) shows that maternal education, wealth, and children's growth were included in household factors. The data indicate that there is a persistent and robust link between parental education, wealth, and child growth and child cognitive achievement. Furthermore, these data show that, even in late childhood and adolescence, a household's capacity to provide appropriate nourishment is just as significant as economic and educational resources. Similarly, Nguyen (2019) suggests that household variables such as household expenditure and father's schooling account for the majority of the ethnic disparity in school enrolment in Vietnam. A larger group of factors, including a child, household, commune, school, and peer traits, explain gaps in education progress and performance. A similar study on the Indian students by Ghose (2011) found that the parents' behavioural pattern influences the children's performance.

According to the information gathered by Hill and Stafford (1974), from the survey research centre of the University of Michigan on time spent by family both inside and outside the home, it was revealed that mothers from higher status invested three times more time contrast with low-status mothers in preschool child care. Authors said that time investment in preschool children impact the psychological achievements of the child and furthermore shown that equivalent educational policies for each educational system don't imply the same opportunities.

Dornbusch *et. al.* (1987) has tried to discover the impact on school performance of the offspring of various child parenting styles (authoritarian, permissive and authoritative). They gathered information of 7836 understudies from six high schools in the San Francisco Bay area through a questionnaire in 1985 which is 88% of the aggregate enlistment of those schools. Authors found that families with authoritarian or permissive tendencies from parents were prone to have students who do not do well in high school and the families which had exceedingly

authoritative child-rearing had kids who scored higher grades in school. It is likewise noticed that diverse child-rearing style has a distinctive impact on genders, age group, family structure, parental education group. However, paying little heed to each group performance, the connection of each style to school performance demonstrates an anticipated pattern within each group.

Children from 'intact' households, from higher economic backgrounds, and with parents with higher educational qualifications, in particular, have an advantage. Scott (2004)'s study using data from a British household panel study, bivariate multivariate analysis revealed so. The study also supports the theory that the mother, as the primary caregiver, has a greater interpersonal impact on the educational performance of her children than the father. Early adolescent parent-youth communication has an impact on eventual educational success, but only for mothers, not fathers.

Father's education level and employment, mother's education level, eyesight and hearing difficulties, school attendance, crowding index, and birth order were found to have a significant influence on school performance in a cross-sectional study conducted by Kamil (2005) to investigate the factors that may have influenced the academic performance of third-grade students. Ten intermediate schools were chosen at random from various districts in the Basrah Governorate (5 schools for girls and 5 schools for boys). A total of 480 students (240 females and 240 boys) were chosen at random and systematically for the research (one of two). The researcher questioned and analysed them using a customised questionnaire created specifically for the study. According to the results of the mid-year test, the students' school performance was divided into two categories. The study recommended the provision of and a proposal for an education programme to assist them in motivating their children, improving communication with teachers and administration staff, conducting periodic vision and hearing screenings, and education of teachers to be aware of students with disabilities and to recognise their needs. Pokropek *et. al.*, (2015) has used the PISA 2012 surveys conducted in 34 OECD and 31 partner countries and economies on two-stage stratified representative samples of students enrolled in lower-secondary or upper secondary institutions and aged between 15 years and 3 months and 16 years and 2 months. They found that across most countries educational attainment of parents impacts the performance of students in Mathematics, reading, and science but mostly indirectly, through the positive influence it has on occupational status and, in turn, through the positive influence occupational status has on student's access to cultural possessions.

Authors (Chiu *et al.*, 2016) has surveyed to analyse the input of perception among students about academic achievement based on income of family, education of parents and their race. The survey was conducted among 94 college students of the second year from a small, liberal arts, college in New York City during the fall of 2009. Among all the respondents, 52 were female, and 42 were male. Student's average grade points were used as a measure of academic achievement. The research demonstrated that the education level of fathers has a greater impact on academic achievement of the students.

Authors (Machebe *et. al.*, 2017) analysed the impact of socioeconomic status (family income and parent-child relationship) on the academic performance of the students of Senior High school in Japan. Data was collected through a well-structured questionnaire by using four Likert scale methodology to understand the effect of income status of parents and attitude on student's academic performance at school. Results of the study show that more than the parent's financial status, involvement by parents in school activities of children mattered in uplifting the children academic performance in school.

2.6 Educational Performance and Household Features

In addition to all the above-discussed aspects, characteristics of the household they belong to, influence the educational performances of children as well; such as availability and knowledge on using computers, size of household, as in the number of children, their expenditure on education, etc.

2.6.1 Availability and Use of Computer

Giacquinta *et. al.* (1993) revealed that children use computer for educational purposes only if their parents take an active role in opting software, sharing time with their children at the computer, offering encouragement, and helping the children in solving the hurdles in the software. The author used the term "the social envelope" to refer to the beliefs and behaviours which are required for home computers to be used successfully for educational purposes. Another study (George *et. al.*, 1995) finds that in the case of computers "Different types of learning environment, some of which encourage learning while others discourage." Technology doesn't educate by itself only if there is a conducive social environment does learning occur. Such an environment only can be provided by parents who have monetary resources. Similarly, the study (Attavel and Battle, 2006) examined the effect on the

educational performance of having a computer at home and also analysed the inequalities in educational outcomes if children have a computer at home. They said having a computer is related to higher grades in Mathematics and reading. Although the effect depends on the socioeconomic status of the child, children from higher SES tend to achieve more educational benefits compared to their counterparts of lower SES. They also argued that having a PC at home may produce another sesame street effect whereby an advancement that held extraordinary guarantee for poor youngsters to get up to speed instructively with progressively well-off kids is by and large expanding instructive hole among well-off and poor, among young men and young ladies, between ethnic minorities and white, even among those with access to the innovation. However, other forms of social inequalities which already exist in society may modify the use of computer and affects the educational gains which can be derived from the computer. They have found the gaps between boys and girls and between ethnic minorities and white, regarding having a computer or not. They also observed gender and racial discrimination regarding how much benefit is obtained from computers among those who have a computer at home.

2.6.2 Household Size and household resources

It has been shown that the number of sibling has an impact on school performance, particularly for female students who spend time caring for their younger siblings. Children's educational performance and number of siblings are negatively related, and there have been many instances in previous literature such as Downey's work. By using resource dilution model for the data set of 24,599, it was found that as the number of siblings increases the available resources decreases overall (parental resources being finite). However, relationships bank on if resources are interpersonal or economic. It is parental resources that explained the negative effect between the number of siblings and educational outcomes. According to Blake (1981), there are three types of parental resources. First, kind of home, necessities of life, cultural objective like books, pictures, music, etc. Second, special attention to the child, intervention by parents and teaching. Third, chances to get involved with the outside world. The author has also argued that more children mean more divided resources (qtd in Downey, 1994). Availability of objects for education (like books, space to study etc.) reduces as the number of siblings increases in the family (Blake 1981, Teachman, 1987), monetary support by parents decreases to support college expenses (Steelman and Dowell 1989, 1991) and there are very fewer chances of taking music or dance classes or travelling outside the country (Blake, 1989). (Hill and Stafford 1974)

shows as the number of siblings increases, spending time with parent decreases. (Blau and Duncan 1967; Featherman and Hauser, 1978) People perform better if they have fewer siblings and it has been observed across a variety of samples, methods, subgroups and educational outcomes. This effect remains net of the effect of parent's education, household income, race and age (qtd. in Downey, 1997). The number of siblings has a negative relation with years of educational attainment and other educational outcomes such as grades, the probability of getting a degree from high school, standardised test scores, etc. (Alwen 1991; Blake 1981, 1985, 1989; Marcy and Steelman 1984). The indirect relationship between the number of siblings and educational performances is artefactual; it is a function of socioeconomic status, as argued by (Ernst and Angst, 1983). A similar study is done by Blake (1989) concerning family size and achievement, where the author has used all the data set which was available and reproduced the general pattern analysed by others that school performance of the students decreases as the number of siblings increases. Blake (1981) by utilizing secondary examinations of various large-scale surveys which incorporate number of siblings as factors and subsequent to applying dilution technique results recommended that giving cultural and physical favourable circumstances at home are not as critical for academic aspiration as the child's view of academic support by parents' treatment. Children are progressively spurred by parental consideration, collaboration and support than by detached conditions. The study additionally discovered that as cultural and material favourable position expanding number of children dilute the resources or individual inputs from guardians. Blake (1985) endeavoured to find a connection between the number of kins or family size and educational mobility in American society. He pooled data from Occupational Changes in a Generation (OCG 1962 and 1973) and furthermore utilized yearly information from General Social Survey 1972-1973 (GSS 72-73) and after that segregated information into three diverse age groups of 20-34, 35-49 and 50-64. The total years spent on education, years of graded schooling (0-12) and extent of secondary school graduates attending a college were the dependent variables of the study and results from features that there is real interaction between family size and the impact of father's education on son's schooling. This connection diminishes as an aggregate number of education increments. another consequence of the investigation demonstrates that at graded schooling level, men from little family size were less influenced by their father's educational attainment yet men from huge family sizes were relatively more influenced and furthermore father's educational attainment is non-existent for a proportion of high schooling graduate going to college for the small family size however it has an impact on large family size. Across all datasets, education of father was the only other factor than the number of siblings which

affects educational attainment. (Jensen 1980), too showed an indirect relationship between size of siblings and educational performance by including parents' education (qtd. in Downey, 1997).

Teachman (1987) contends that guardians use resources to make home conditions more favourable for higher attainment in education for children by utilizing the information from a national longitudinal study (NLS) for secondary school class of 1972 of the United States. The information was analysed on the hypothesis that family educational assets positively affect school attainment of children net of other indicators of family background and family educational resources decrease in significance at a higher level of schooling. The study found that educational resources play a crucial role in determining the level of schooling for men and women. Although the impact of educational resources on men was stronger than the impact on women. The impact of educational resources declining on the decision about educational level in light of the fact that different resources develop with expanding education.

2.6.3 Household Income and Wealth

Lin and Lv (2012) conducted a study to analyse the effect of family income on the academic performances of children to investigate education in China. The study was based on CSPF-2014 data, and the other factors like parental education, father's age, residence, and household size were kept controlled. The study utilized OLS and logistic regression models to analyse the effect of family income on children's academic achievement. The findings show that total sample and urban families have no significant impact on the academic achievement of children, but in rural families, income plays an influencing role in enhancing a children's educational level. The study conducted in Ghana by Adzide *et. al.* (2016) focused on the sources of the family income, student's expenditure pattern on campus and their performance. The study reveals that family financial status affects students' performance to some extent, but it is not a necessary indicator of higher academic performance. Zhan (2005) have studied the association of parental assets with their expectations and involvement, and the educational performance of children and found that parental assets positively affect educational performance of children, after controlling for income and other parent characteristics. The study has a sample of 1370 children and extracted data from the mother-child data set of the National Longitudinal Survey of Youth, 1979 (NLSY79). Information regarding parental assets, expectations and involvement, and other parental characteristics were collected from the survey year 1998, and data on children's academic performance are from the year 2000 when these children were

between 7 to 14 years old. According to the study, family assets encourage females' achievement since those from better-resourced homes are more likely to be in a higher reading assessment group than their male counterparts. Ansong *et. al.* (2015) did a study that focuses on how parents' and youth's expectations may intervene in the academic performance of junior high school students in Ghana. It was a cross-sectional analysis of baseline data from the ongoing youth Save Ghana experiment led by the Center for Social Development at Washington University in St. Louis. The youth Save Ghana Experiment is a large social experiment testing the long-term impacts of youth saving accounts on educational, psychosocial, health, and financial capability outcomes and household financial well-being. Parents were interviewed at baseline from two regions upper east and upper west of Ghana. The study shows that although there is no direct relationship between household assets ownership and academic performance there is evidence that assets are indirectly related to academic performance through youth's academic expectations. Vegas and Coffin (2015) analysed the diminishing correlation between education expenditure and learning outcomes by using the data from a large group of countries around the world, study found that the association between educational spending and student performance in Mathematics is statistically significant among the system that spends below a threshold. Also controlling for average income per capita and income inequality, the study suggests that education spending is related to increased students' performance only among systems that spend below this threshold. Shanks (2007) using the data from the Panel Study of Income Dynamics, tried to study the influence of wealth relative to income across several child development outcomes. The author has used OLS regression and results show that wealth is a significant predictor for the applied problem Math score and reported behaviour problems.

2.7 Type of School and Educational Performance

Education, as an important tool of empowerment, has been handled not only by the government but also by various private organisations, individuals and entities. With education being a fundamental right, it is not however the sole jurisprudence of the government or the state. The state is capable of enhancing public education which would make it accessible to all sections of the society, nonetheless, the existence of private schools is not to be seen in isolation. The type of school a child studies, in fact, has a significant role in determining his/her future in academics and the job market. This again varies with respect to location, time and other factors, which the literature elaborates on.

James and James and Woodhead (2014) aimed to analyse the variables that underpin the schooling decisions that households make. It was usually a negotiation on the complicated school hierarchies within their communities, as well as trends in school choice. They used longitudinal data from two cohorts of around 3,000 children collected as part of the Young Lives project, as well as a qualitative sub-study involving a purposively selected sample of Young Lives parents and children. As household circumstances change and school alternatives are re-evaluated, the research provides new evidence of an increasing tendency for households to make consecutive school decision for their children. According to 2009 household survey statistics, 16 percent of an eight-year-old sample had switched school at least once throughout the early grades of primary school, up from 5% of a comparable sample of eight-year-olds in 2002. The effects of a more dynamic and market-driven educational system are investigated, and the ramifications are considered. Goyal(2009) using the data of test scores of fourth grade students enrolled in a public and private school on the eastern part of Orissa in India found that there is truly private school effect as only 12-13% of test score difference is due to selection on unobserved factors. Goyal and Pandey (2009) gathered data through a primary survey from Madhya Pradesh and Uttar Pradesh, India to analyse the difference in two type of schools. Authors have found private school students score more than public school students. Students from higher socioeconomic backgrounds opt for private schools. The private school has a lower pupil-teacher ratio and the salary for teachers is less. Private schools are more cost-effective despite large salary differential.

Studies have found that in rural and urban areas performance for private school students is better than public school. Chudgar and Quin (2012) established this by using the household data from the Indian Human Development Survey (IHDS), 2005 from India with 41554 households related to students' performance data on writing, reading, and Mathematics. Furthermore, Sarmah and Hazarika (2012) found that gender affects the interest in Mathematics for private school children. They had collected data from 13 schools both government and a private sample of 384 students is considered as representative of the population of Guwahati as it consists of a range of different socio-economic backgrounds. On a different note, Okyere (2019) investigated if the type of school and gender affect students' self-concept and Mathematics achievement. It found that gender and type of school significantly affect self-concept and Mathematical achievement. The study used the survey data gathered about students' self-concept and achievement in order to describe these variables in relation to

students' gender and the type of school attended. The study involved 119 students from 5 private, 5 mission and 3 local authority schools.

Woodhead et al. (2013) used YL longitudinal data for two cohorts of 2906 children for the state of Andhra Pradesh, India and found that students having lower socioeconomic strata, rural areas, girls are lesser in number in private school even though the access gap has decreased, the gender gap has broadened while Witte (2016) argued that the student achievement difference in public and private schools is very low.

Singh (2015) using the data from YLS between 2002 and 2011 in the state of Andhra Pradesh, India found a positive effect of a private school on English, no effect on Mathematics and heterogeneous effect on Telugu for 8-10 years old students in rural areas at the same time no evidence of positive effect in urban India. Results of Hooda and Devi (2017) descriptive study on a sample of 400 students show that the type of school and gender are significant for determining Mathematical achievement among secondary school students. The author has utilized three-way ANOVA to analyse the data. It also found that students who attend a private school scored higher in reading and Maths.

Ali and Faaz (2017) used simple random sampling technique data of 196 senior secondary school students, out of which 102 were male and 93 were female, taken from both government and private schools of Aligarh city. The authors have used mean, S.D., Pearson product-moment correlation and t-test. The study shows that study habit positively influences the academic achievement of students and female students have good study habit than male students. Private school students possess high study habits than government school students. Saleh and Rahman (2016) used the sample of 317 students of which 135 and 182 were boys and girls respectively and data was collected, using the Algebra achievement test, from three different types of schools in Malaysia that are national schools, Islamic-religious schools and boarding schools and analysed using a two-way ANOVA test. The research found gender and type of schools do affect students' achievement in Algebra. Singh and Mukherjee (2019) have compared children who attended private preschools and those who attended government preschools in India based on longitudinal data from Young Lives India, to determine whether the former demonstrated higher cognitive skills and enhanced subjective wellbeing at 12 years of age. Using linear logistic regression models, the analysis reveals that private pre-schooled children outperform children in government preschools in Math and subjective wellbeing. Furthermore, children who start preschool before the age of 4 will be more likely to achieve

higher cognitive achievements than those who begin before the age of 12. Woldehanna and Gebremedhn (2016) compare learning outcomes across children of the same age (age 12) who were born seven years apart — in 2006 and 2013. It used statistical analysis and data from the Young Lives Older Cohort, who were 12 years old in 2006 (Round 2 of the survey) and the Younger Cohort, who were 12 years old in 2013 (Round 4), with an emphasis on the Peabody Picture Vocabulary Test (PPVT), Mathematics, and common reading test scores. Gender, location, region, caregiver education, and whether children attended private or public school were all used to decompose changes in test results for the PPVT, Mathematics, and reading items. Authors have discovered that children's reading and Math skills had deteriorated significantly, with girls experiencing a higher rate of decline in Maths and reading than boys, as well as children living in SNNPR and Oromia (compared to children from other regions), rural children (compared to urban children), children in government schools (compared to non-government schools), and children whose caregivers had received little or no education.

Chand (2013) conducted a study on 200 secondary school students by using the study habit inventory constructed by Dr B.V. Patel (1975) to collect the relevant data. The findings indicated that secondary school students in government schools do much better than students in private schools in terms of the home environment, work planning, and subject planning, whereas private school students perform significantly better than government school students in terms of test preparation. However, there is no substantial difference between government and private secondary school students with respect to reading and note-taking, concentration, habit and interest, school environment component of study habit, and total study habit. Alimi *et. al.* (2012) found a considerable discrepancy in the amenities provided in public and private schools in Ondo state. The study had resorted to a proportionate random selection approach to choose 50 schools and analysed the data using the T-test. There was no discernible difference in academic achievement between the two types of secondary schools, however, Taiwo (2011) in a survey gathered 70 responses using a random selection approach, including 30 from the sciences and 40 from engineering. The government, private entities, and tertiary institution administration all need to do more to promote, motivate, and help students in their academic pursuits.

2.8 Impact of Others Features on Education Performance

Dreze and Goyal (2003) conducted a study that found a robust link between the mid-day food programme and student academic progress. Paul and Mondal (2012) includes 300 kids (N =

300) from both urban and rural locations and includes both "Below Poverty Line" (BPL) and "Above Poverty Line" (APL) pupils (APL). The chi-square test found a substantial link between the mid-day feeding programme and student academic success. The findings of the multiple regression model also showed that taking into account the determinants of enrolment, attendance, retention, and dropout of students, there was a substantial beneficial effect on the academic success of students. In addition to academic accomplishment, the mid-day meal programme provides other benefits such as eliminating classroom hunger, promoting social and gender equality and instilling healthy habits in kids (such as cleaning their hands and utensils before meals). However, in order to achieve good results, it was suggested that the mid-day meal programme should be integrated with the government's ongoing health awareness campaigns. Chakraborty and Jayaraman (2019) argued that longer exposure to mid-day meals had a strong favourable influence on learning achievement in a study of test scores from roughly 12.3 million primary school children in India. The average reading score for students who ate school lunch for three to four years was 18 per cent higher than for those who ate it for less than a year, according to the research. Children who have access to the programme do 9 per cent better in Math.

Faulk *et. al.*, (2010) show that working for a living is negatively affected the course performance, and that different types of education financing have different effects on course grades, with employer financing (14.75 percentage points higher) and loans (8.59 percentage points higher) having positive and significant effects, while other types of financing (scholarship, financial aid, and self-financing) have no significant effects. On the contrary, Arcidiacono (2005) investigated how financial aid programmes influence a student's decision to attend a certain university and their future earnings. The study, which focuses mostly on black students, indicates that while financial help has a considerable impact on black students graduating from college, race-based additional aid above the standard amounts has a small impact on wages. This means that extra help beyond what is required to bridge the gap may have little impact on future earnings. If we regard grades and future wages to be related, this might potentially imply something about the impact of increased help on grade point average. Grant aid, loans, and on-campus work are the three categories of financial help examined in this study because these aid levels must be included as explanatory variables, including aid eligibility is also important (Alon, 2006).

CHAPTER-III

GENDER GAP IN EDUCATIONAL PERFORMAMNCE IN UNITED ANDHRA PRADESH

“We shall see better days soon and our progress will be greatly accelerated if male education is persuaded side by side with female education.”

Dr. B. R. Ambedkar

Abstract

The National Achievement Survey (NAS-2014) depicts a critical contrast across states in the average level of students' performance. According to the NAS-2014 report gender gap in academic performance for both Mathematics and reading level is visible for Andhra Pradesh and national level (India). In fact, some research indicate gender as a significant factor in children's academic performance, where boys outperform girls in various educational fields. This chapter aims to answer if there is a gender-based disparity in educational performances due to the children's background characteristics. What are the factors that cause a gender-gap and the extent to which these factors contribute to the gap in educational performance? The chapter attempts to approach these questions using the fourth round of Young Lives survey data based on the older cohort. Based on the results of a simple linear regression model and gender-based means of the explanatory variables, study adopted the Oaxaca-Blinder decomposition technique. Regression results for both mathematics and English subject shows gender is one of the significant variables to determine the educational performance along with time spent on study, years of education, parental education, and expenditure on education. The majority of the performance difference, using the Oaxaca-Blinder technique, was explained by the differences in the variation of mean outcome of male and female children, was indicative of the impact on female children. The entirety of the coefficient effect is explained by BMI and Years of schooling for mathematics performance and for English it is explained by mother's education. For English test score Endowment effect is also significant and entirety of this effect is also explained by years of education and expenditure on education.

3.1 Introduction

The united Andhra Pradesh⁸ is the fourth largest state in India's area with a population of around 84 million, having equal male and female population with 42 million each (Census, 2011). The National Achievement Survey (NAS-2014) depicts a critical contrast across states in the average level of students' performance. There has been, undoubtedly, substantial debates about educational performances and its relationship with gender (Attewel and Battle, 1999; Farooq et al., 2011; Maddah *et al.*, 2003; Stevenson and Baker, 1987; Teachman, 1987), family size (Downey, 1995), parental resources (Attewel and Battle, 1999; Downey, 1995), socio-economic background of the child (Attewel and Battle, 1999; Considine and Zappala, 2002), family relationship with the child's school (Stevenson and Baker, 1987), etc. The NAS-2014 report also found that the gender gap is noticeable in Andhra Pradesh with regard to educational achievement. Gender gap was prominent in Mathematics and more so the score obtained in Mathematics was reported to be lower than the national average (NAS, 2014). Boys are performing better than the girls in Mathematics and girls are out performing boys in reading comprehension and the trend is similar for India as well (NAS, 2014). Along the same line, ASER (Annual Status of Education Report) has been collecting the data on academic performance since 2005. ASER (2014) findings for India shows a clear learning gender gap where more percentage of male children can solve the simple division problem compared to the female children who are in the school. Similarly, ASER (2010, 2014) clearly shows a gender gap in identification of number in erstwhile Andhra Pradesh. For reading level, female children are more equipped than male children. Hence, the gender gap in academic performance for both Mathematics and reading level is visible for Andhra Pradesh and national level (India). In fact, some research indicate gender as a significant factor in children's educational performance, where boys outperform girls in various educational fields.

According to conventional wisdom, India has a long-drawn history of neglecting its women and the pattern is still prevalent. A study has suggested that the distressing condition of women has its underlying foundations in the ignorance of parents who fail to educate their daughters (Desai, 1994, Ghose, 2011) presents that the behavioural pattern of parents significant affect

⁸The state of Andhra Pradesh was bifurcated in 2014, with the emergence of the new state of Telangana, Andhra Pradesh refers to the erstwhile Andhra Pradesh throughout this chapter.

the child's educational level; if the parents are perfect capitalists in nature, they will revolve around benefit and will incline toward a male child.

Across different countries, studies have analysed academic performances based on gender. In fact, many researchers have concluded that gender is a significant factor in a person's academic performance. For example, (Collins *et. al.*, 2000; Legewie and Diprete, 2012), in their studies on Australian and German children, have found that there is a gender gap in academic performance. In continuation with this line of thought, a study of the Indian subcontinent by Kingdon (1996) found that boys perform better than girls in all types of schools. At the same time, some studies have found contrary results. For instance, reviews (Farooq *et. al.*, 2011; Fergusson and Horwood, 1997) have found that females perform better than males in Pakistan and New Zealand, respectively. Taking forward this idea, Attewell and Battle (1999) found that the availability of computers at home has a positive and distinct effect for boys and girls in the US. Also, Duraisamy (2002), in the study of India, found that there is a substantial difference in return to schooling based on gender. While such studies have been published, Jamil *et. al.*, (2016) found that in both rural and urban areas of Pakistan, there is no substantial gender difference in performance. Parental education has been identified as a crucial determinant of students' achievements in both Peru and Pakistan (Farooq *et. al.*, 2011; Arteaga and Glewwe, 2014). In the US, father's education influences a child's educational achievement (Blake, 1985; Chiu *et. al.*, 2016). On the other hand, (Dornbusch *et. al.*, 1987) talk about how families who are high in authoritarian or permissive parenting are prone to have children who performance low in high school, and how the families who are exceedingly authoritative in child-rearing had kids who scored higher grades in school.⁹

Several works of literature point towards the relationship between household factors and educational performances. In their studies conducted in the US, Alwin (1991) found that sibship has a significant influence on the growth of the verbal skills, while Blake (1981)

⁹“While controlling, the action of their children in accordance with an absolute set of standards; parents emphasize and expect obedience, tradition and respect for culture and authority, verbal reciprocity between parent- child gets dispirited. Liberal tolerant and accepting nature of parenting, toward the child's need, forms the mutual understanding and allows considerable self-regulation by the child. Authoritative parenting is nothing but an expectation of mature behavior from the child enforcing rules and standards and using commands and sanctions when necessary. Encouragement of the child's liberty and individuality; open exchange of words between parents and children encourage verbal reciprocity and recognition of the rights of both parents and children.” Dornbusch, Ritter, Leiderman, Robert, and Fraleigh (1987) borrows these definitions from Baumrind and Black(1967)

concluded that the number of siblings indirectly influence college plans of the students. Furthering this idea, studies have found that individuals perform better when the number of siblings is less and impact stay net of the effect of family income, race, and age (Blau and Duncan, 1967; Featherman and Houser, 1978). Similarly, a study found that there is an interaction between family size and educational mobility in American society (Blake, 1985), and there is a reverse association of the number of siblings with educational performance (Jensen, 1980; Blake, 1989). Educational achievement is artefactual; it is a function of socioeconomic status (Ernst and Angst, 1983) and in the US, educational resources in the house play a crucial role in determining the level of schooling (Teachman, 1987). Similarly, a study conducted in Australia by Considine and Zappala (2002) concluded that the social and economic part of the socio-economic factors has separate influences on educational outcomes. Lin and Lv (2012), in a study on Chinese children, found that income positively influences a child's educational level in rural areas. On the sameline, a study conducted in Ghana stated that the family's financial status has an impact on students' performances (Adzido *et. al.*, 2016) and that household assets ownership indirectly relates with academic performance through youth's academic expectation (Ansong *et. al.*, 2015). Similarly, a study conducted in the US by Teachman (1987) found that educational resources increase educational attainment, and another one by Zhan (2006) concluded that parental assets are positively related to children's math and reading score. Also, it is parental resources that explained the negative effect of several siblings and educational performances in the US (Downey, 1995).

On the other hand, the study of the US shows that the number of siblings has a negative relationship with years of education and different educational achievements such as grades, the probability of receiving a degree from high school, standardized test score, etc. (Alwen, 1991; Blake, 1981, 1985, 1989; Mercy and Steelman, 1982). Farooq *et al.*, (2011) also stated that socio-economic status is significant for the overall academic performance as well as in math and English. Adding to these, Attewell and Battle (1999) found that a home computer is related to high grades for math and reading in the US. The impact of a child's health and time spent on studying on the educational achievements. Arteaga and Glewwe (2014), in a study conducted in Peru, found that children's health is an essential factor in the gap in math and vocabulary. Similarly, there is an inverse connection of BMI and waist circumference (Hermann *et al.*, 2011) with the educational levels among European women. A similar study (Maddah *et. al.*, 2003) conducted in Iran shows the inverse impact of BMI on educational performance for women and positive for men. On the other hand, the time allocation per week on studies has a

positive influence on the academic performance of Indian children (Kingdon, 1996). Furthering this point, parental involvement in school activities has been identified as influencing the academic performance in schools in both the US and Japan (Downey, 1994; Machebe *et. al.*, 2017). Similarly, Hill and Stafford (1974) argued that parental time investment in preschool children influence the cognitive achievement of American children.

The above-stated studies reflect that factors such as child characteristics which includes gender, time to study, BMI, years of education, and social background of the child; parental education qualification and involvement in academic activities of the child; household characteristics like family size, household assets, expenditure on education, and availability of the computer at house are associated with educational performance of the children. Literature (Nagi and Sridevi, 2020; Singh and Krutikova, 2017; Dickerson *et al.*, 2015; Farooq *et al.*, 2011; Maddah *et al.*, 2003; Teachman, 1987) also portrays that these different factors cause gender gap in academic performance of the school going child. This chapter aims to answer if there is any gender-based disparity in educational performances due to background characteristics of the children. What are the factors that cause a gender- gap? This chapter also measures the extent to which these factors contribute to the gender gap in educational performance.

3.2 Methodology and Data sources

This segment of the chapter discuss the source of the secondary data used in this chapter for the study. It also talks about the different variables used for the study. This section also discuss the description about the variables of the study.

The Young Lives collected data from three regions of erstwhile of Andhra Pradesh i.e., Andhra Pradesh, Telangana, and Rayalaseema. The data collected from 7 districts and 20 mandals of the erstwhile Andhra Pradesh. The fourth-round data consists of robust information about older cohort and their development in due course of 12 years. The study used the fourth round of data for India and the older age cohorts. The first round was conducted in 2002 consists of total 1008 children and due to the attrition¹⁰ rate which was 4.3 percent, the fourth round, conducted in 2013, for older cohort had covered 952 children out of which male children consist 48.8 percent and female children 51.2 percent. Ethnicity wise, 21.4 percent, 11.1 percent, 46.1 percent, and 21.3 percent of the children are Scheduled Caste, Scheduled Tribe, Backward

¹⁰ Death is not included within attrition.

Classes, and other castes, respectively. The information required for the variables was available only for 809 observations in which 404 are male, and 405 are female children.

The following variables are considered for the study and categorised into child-specific features, parental education, and household features based on the objective of this chapter and the existing literature.

The Statistic descriptions are described in Table 3.1 for the public school children. It consists measures of central tendency (mean and median), the measure of dispersion (range and standard deviation). It also includes skewness and kurtosis. Where, skewness measures the symmetry or in other words, lack of symmetry. A data set is called symmetric if it is equally distributed to the left and right side of the average value. At the same time, kurtosis measures if the data set is heavy-tailed or light-tailed relative to the normal distribution. If the data set has an outlier, it would be heavy-tailed; otherwise, it would be light-tailed in case of lack of outlier. In our analysis, variables such as Gender, SC, ST, OBC, Availability of Fellowship, and Availability of computer are dummy variables.

The children's test score in Mathematics and English on average is about 14 and 15, with a median value of around 14 and 16, respectively. The range for the mathematic test score is 29 (29 – 0), with the standard deviation from the mean is about 7. Similarly, the English test score range is 18 (22 – 4), with a standard deviation of about 4 from the average value. Additionally, as per Table 5.1, the descriptive statistics for the children enrolled in public school for the variable Gender show that the study has included both male and female student equally (Gender=0.504). Similarly, dummy variable SC, ST, and OBC reflect that about 18 percent, 10 percent, and 33 percent of the children in our data set belong to SC, ST, and OBC categories that are enrolled in public schools, respectively. On average, time spent on study by a child, enrolled in public school, apart from the time spent in school is approximately one hour, with a median value of zero.¹¹ The range for the time spent on study is 12 (12 – 0), with the standard deviation of about 2 from the average value. The BMI of the children, on average, is about 19, with a median value of about 19. The deviation of the BMI from the mean value is about 3. On average, the years of education of the children is about 12 years and the median value is 12 years. The years of education received by the children is in 9 to 15 years range, with the

¹¹ On a typical day (i.e. not a weekend or holiday)

standard deviation of about 2 years from the mean years of education. The availability of the fellowship for the students shows that almost 57 percent students are receiving fellowship.

Furthermore, the mother's years of education is almost 2 years on average, while the father's year of education has the mean and median values of approximately 4 and 2 years, respectively. The range for both mother and father's education years is 14 years. The standard deviation from the mean years of education for mother and father is about 4 and 5 years, respectively. It is interesting to note that, on average, children have achieved more than six times and thrice than their mother and father's educational attainment, respectively. Also, on an average education received by mother's educational attainment is lower than the father's educational level.

The total money spent on education by family in the last academic year is approximately ₹ 6,012 on average, with a median value of ₹ 3,212. The range for the total expenditure on education is ₹ 80,000, with a standard deviation of about ₹ 9,392. The family's household size is about 5 members on average, with a median value of 4 members. The range of the household size is 12 (13 – 1) members. The total of the five most valuable assets owned by the household is about ₹ 12,876, with a median value of ₹ 5,000. The deviation from the mean value is approximately ₹ 34,637. Result shows that less than 1 percent students are having availability of computer.

Table 3.1: Descriptive Statistics

Variable	N	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	kurtosis
Mathematics Test Score	809	14.744	15	0	29	6.878	-0.235	2.181
English Test Score	809	15.411	16	0	22	4.209	-0.802	3.437
Gender	809	0.499	0	0	1	0.500	0.002	1.000
Time to Study	809	1.349	1	0	12	1.604	1.409	6.331
Body Mass Index	809	19.581	18.943	13.119	35.145	3.106	1.397	5.992
Year of Education	809	10.354	12	0	16	5.273	-1.314	3.033
SC	809	0.137	0	0	1	0.344	2.109	5.447
ST	809	0.064	0	0	1	0.245	3.553	13.626
OBC	809	0.383	0	0	1	0.486	0.481	1.231
Availability Fellowship	809	0.478	0	0	1	0.500	0.087	1.008
Mother's Education	809	3.125	0	0	14	4.105	1.023	2.805
Father's Education	809	5.068	5	0	14	4.873	0.371	1.699
Expenditure	809	15896.79	5700	0	442200	29044.42	5.786	65.427
Household Size	809	4.705	4	1	26	1.792	2.995	28.884
Assets	809	15399.89	5500	100	500000	29461.98	9.186	129.457
Availability of Computer	809	0.052	0	0	1	0.222	4.039	17.317

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

3.3 Determinants of Educational Performance

We have taken Mathematics and English Test Scores as an indicator of educational performance that is the dependent variable in the analysis. Educational performance is a function of child specific features, parental education and household features which are our explanatory (independent) variable categories. The obtained Mathematics and English test scores showing whole sample size has been regressed on explanatory variables through diversifying male and female samples. The results of the analysis are summarized in the following Table 3.2 and 3.3.

3.3.1 Determinants of Performance in Mathematics

The outcomes of the regression analysis for Mathematics are summarised in Table 3.2 where it is observed (first two columns of the Table 3.2) that the variables Gender, Time to Study, Body Mass Index, Years of Education, Caste (SC and ST), Mother's education, Expenditure on Education, Assets, and Availability of Computer in Household have significant effects on the Mathematics test score (educational performance) of YL children.

Similar to the previous literature (Downey, 1994; Attavel and Battle, 2006; Teachman, 1987; Balatchander, 2013; Arteaga and Glewwe, 2014; Collins and et. al., 2000; Hooda and Devi, 2017; Okyere, 2019; Saleh and Rahman, 2016; Chinyoka and Naidu, 2014; Nagi and Sridevi, 2020, 2021; Dickerson et al., 2015) where it is proven that gender has the influence on educational performance. We find in our analyses that male and female have difference in educational performance where the results show that female educational performance is lower than male children. Results portrays that *ceteris paribus*, the average Mathematics test score for females compared to males are lower by about 2.056 units. Thus, Mathematics performance of the female children is lower compared to male children.

We have also included time spent on studying apart from that in school, in our analysis as well which is a significant determinant of Mathematics performance of the YL children (just like Kingdon, 1996; Nagi and Sridevi, 2020; Ali and Faaz, 2017; Chinyoka and Naidu, 2014). The partial regression coefficient for time to study, for the whole sample, for males and for females, are 0.886, 0.771 and 1.033 respectively. This indicates that other variables held constant, as the time allotted to studying increases by one unit, on an average, the Mathematics test score would increase by 0.886 units for the whole sample, by 0.771 units for males and by 1.033 units for females. We find that as a child spends more time on studies apart from that in school, they

will perform better on the test, particularly the female children. In other words, time allocation on studies is positively associated with the Mathematics performance of the children, more so for female children.

Table 3.2: The Regression Results for Mathematics

Mathematics Test Score	For whole Sample		For Male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	2.056	0.000***	-	-	-	-
Time to Study	0.886	0.000***	0.771	0.000***	1.033	0.000***
Body Mass Index	0.041	0.490	0.195	0.029**	-0.092	0.259
Years of Education	0.394	0.000***	0.521	0.000***	0.291	0.000***
SC	-1.392	0.026**	-1.077	0.253	-1.841	0.039**
ST	-2.120	0.013**	-2.125	0.072*	-2.141	0.107
OBC	0.021	0.962	0.050	0.942	0.144	0.815
Availability of Fellowship	0.295	0.495	0.014	0.983	0.477	0.444
Mother's Education	0.158	0.013**	0.095	0.311	0.239	0.006***
Father's Education	0.047	0.370	0.019	0.778	0.068	0.393
Expenditure	0.00004	0.000***	0.00004	0.000***	0.00003	0.009***
Household Size	-0.103	0.380	-0.169	0.313	0.038	0.828
Assets	-0.00001	0.026**	-0.00001	0.014**	-6.18e-06	0.662
Availability of Computer	1.773	0.031**	2.090	0.128	1.172	0.234
Constant	7.051	0.000	5.533	0.010	9.468	0.000
Number of obs.	809		404		405	
F	36.05(14,794)		19.27(13,390)		19.76(13,391)	
Prob.>F	0.0000		0.0000		0.0000	
R-squared	0.4032		0.4041		0.3815	
Root MSE	5.3599		5.3101		5.3894	

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

The result indicates that if the BMI increases by one unit, ceteris paribus, on an average, Mathematics performance for the male would increase by 0.195 unit. In other words, BMI is significant and inversely related with Mathematics performance of the YL children, specifically with the male children. We also found that the influence of BMI for the female children is not significantly different from zero.

It was found during the fourth round of YL survey that the years of education received by the also has an influence on the Mathematics performance of the children. The partial regression

coefficient, for whole sample, of years of education is 0.394, and it indicates that keeping the influence of other variables constant, as years of education increases by one unit, on an average, Mathematics test score would increase by 0.394 units. Years of education have a significant impact on Mathematics test score for both male and female children also and as the years of education increases Mathematics performance of the children is positively associated with Mathematics performance increases for male and female children with the coefficient of 0.521units and 0.291units respectively, *ceteris paribus*. In other words, number of years of education is positively associated with performance of YL children which is also evident in previous literature (Nagi and Sridevi, 2020, 2021).

The plethora of studies (Singh and Mukherjee, 2019; Nguyen, 2019, Espinosa, 2017; Considine and Zappala, 2002; Attavel and Battle, 2006; Alwin, 1991; Ernst and Angst, 1983; Farooq et. al., 2011; Nagi and Sridevi. 2020) have established the impact of social back ground on the educational performance of the children.¹²We have found that the social background (SC and ST) of the YL children is significantly influence the Mathematics performance. The regression coefficient for the SC dummy shows that Mathematics performance of the children from SC category is lower by 1.392 unit compared to other categories. The regression coefficient for SC dummy for female sub sample reflect that female SC children perform lesser by 1.841 unit compared to female children of other categories. The SC dummy for the male children is statistically insignificant in our results. Similarly, the regression coefficient for the ST dummy reflects that Mathematics performance of the children from ST category is lower by 2.120 unit compared to the other categories. The regression coefficient for the ST dummy for the male sub set indicates that male children with ST background perform lesser by 2.125 unit compared to male children of other categories. However, the ST dummy for the female children is statistically insignificant. Along the same line, the regression results for the children belonging to OBC and other category are insignificant for the Mathematics performance. This suggests that children of SC category, specifically female children are performing lower than the children belonging to other categories. In other words, social background of the children has a significant influence on Mathematics performance and it indicates children belonging to SC and ST category are in worse shape compared to OBCs and other category children.

It has been established in previous studies (Kohn, 1969; Majoribanks, 1979; Heyns, 1978; Arteaga and Glewwe, 2014; Black, 1985; Chiu et. al., 2016; Farooq et al., 2011; Chinyoka and

¹² In Indian context social background is referred to the caste.

Naidu, 2014; Desai, 1994) that parental education and involvement in school activities of the children predict more about child's educational performance. The above regression results present that years of mother's education is significant determinant for the Mathematics performance of YL children particularly in case of female children. The figures for partial regression coefficient depict that if the mother's years of education increase by one unit the Mathematics performance for the whole sample would increase by 0.158 unit and it would increase by 0.239 unit for the female children whereas the result is insignificant for the male children. Hence, the mother's education has more significant impact on female children's educational performance compared to their counterpart while the father's educational status is insignificant in our analysis.

The outcome of the regression reflects expenditure on schooling influence Mathematics performance of the children significantly. The results show that the total schooling cost is positively associated with Mathematics performance. This result is in line with previous literature (Lin and Lv, 2012; Azido, 2016; Kapur, 2018; Chinyoka and Naidu, 2014) where the same direction of influence is found. The partial regression coefficients for the expenditure on education are 0.00004, 0.00004 and 0.00003 for the whole sample, for males and for females, respectively. It indicates that if the total school cost, in other words expenditure on education, increases by one unit the Mathematics score would increase by 0.00004 units for whole sample, by 0.00004 units for male children and by 0.00003 units for female children, keeping other variables constant. Thus, the total expenditure on schooling is an influential determinant for Mathematics performance.

At par with previous literature, household wealth (valuable assets in house) also plays a significant role in order to determine educational performances (Chinyoka and Naidu, 2014; Ansong *et. al.*, 2015; Teachman, 1987; Zhan, 2006; Downey, 1995). The partial regression coefficient for the assets is -0.00001 and -0.00001 for whole sample and for male children, respectively - which means if assets increase by one unit, the average Mathematics test score will decrease by 0.00001 for whole and male children, *ceteris paribus*, which is insignificant. On the other hand, variable asset is insignificant for female child.

The available research (Attewell and Battle, 1999) also indicates that availability of computer at house significantly influence the educational performance of the children. In our results, regression coefficient reflects that on an average, children with computer at house perform better by 1.773 units compared to the children who does not have computer at house, keeping

the other things constant. In other words, average Mathematics performance of the children having computer at house is better than the children not having computer at house.

3.3.2 Determinants of Performance in English

This portion of the chapter analyse the variables affecting English performance of the students. The English test score has been regressed, separately for the both the gender, on the same set of dependent variables. Table 3.3 represents the regression results for the whole sample size in the first panel and second and third panel shows regression results for male and female sub samples respectively.

We find that the variables Gender, Time to study, Body Mass Index (BMI), Years of Education, Social Background, Parental Education, Expenditure on Education, Household Size, and Availability of computer in Household significantly effects the English test (educational performance) scores of children.

Parallel to the previous studies (Downey, 1994; Attavel and Battle, 2006; Teachman, 1987; Balatchander, 2013; Arteaga and Glewwe, 2014), we determine that the educational performance for male is better compared to female children. Regression coefficient indicates, *ceteris paribus*, the average English test score for females is lower by about 0.930 units compared to male children. Thus, in our analysis, we find that there is a difference in the English performance based on the gender where the result shows that English performance for female children is lower than the male children.

Along the lines of available literature (Kingdon, 1996; Nagi and Sridevi, 2020; Ali and Faaz, 2017; Chinyoka and Naidu, 2014), we have included in our research the time allocation for studying apart from in school and analysis results show that variable time to study has significant influence on the English performance of the YL children. The partial regression coefficient for the variable time to study for the whole sample is 0.303, for the males it is 0.292 and for the females it is 0.307. This indicates that other variables held constant, as the time allotted to study apart from school increases by one unit, on average, English test score for whole sample, for male and for female would increase by 0.303 units, 0.292 units and 0.307 units, respectively. Thus, we find that as a child spends more time on studies apart from that in school, the child will score a greater score in the test, particularly the female child performs better than male child. In other words, time allocation on studies is positively associated with the English performance of the children.

Table 3.3: The Regression Results for English

English Test Score	For whole Sample		For male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	0.930	0.000***	-	-	-	-
Time to Study	0.303	0.001***	0.292	0.019**	0.307	0.015**
Body Mass Index	0.058	0.122	0.094	0.070*	0.020	0.710
Years of Education	0.331	0.000***	0.297	0.000***	0.348	0.000***
SC	-0.409	0.248	-0.446	0.387	-0.755	0.111
ST	-0.021	0.958	-0.158	0.809	-0.214	0.678
OBC	-0.156	0.560	-0.610	0.096*	0.253	0.515
Availability of Fellowship	-0.070	0.769	0.115	0.724	-0.095	0.786
Mother's Education	0.100	0.009***	0.039	0.450	0.166	0.003***
Father's Education	0.09*	0.003***	0.121	0.001***	0.046	0.354
Expenditure	0.00002	0.000***	0.00002	0.000***	0.00002	0.029**
Household Size	-0.123	0.042**	-0.150	0.064*	-0.050	0.649
Assets	-4.52e-06	0.285	-2.93e-06	0.477	-0.00001	0.275
Availability of Computer	0.841	0.035**	0.991	0.074*	0.583	0.288
Constant	9.665	0.000	10.491	0.000	10.029	0.000
Number of obs.	809		404		405	
F	40.59(14,794)		20.58(13,390)		24.92(13,391)	
Prob.>F	0.0000		0.0000		0.0000	
R-squared	0.4363		0.4065		0.4493	
Root MSE	3.1932		3.0558		3.3321	

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

The regression outcome reflects that Body Mass Index a significant variable in determining English performance of the YL children. As the available studies (Hermann *et. al.*, 2011; Maddah *et. al.*, 2003) has also suggested educational performance is significantly related with BMI. The partial regression coefficient, for the whole sample and females are insignificant. The result indicates that if the BMI increases by one unit, Ceteris paribus, on an average, English performance for the male would increase by 0.094 unit. In other words, BMI is significantly related with English performance for YL male children.

It was further found during the fourth round of YL survey that the years of education received by the also has an influence on the English performance of the children. The partial regression coefficient, for whole sample, of years of education is 0.331, and it indicates that keeping the influence of other variable constant, as years of education increases by one unit, on an average, English test score would increase by 0.330 units. Years of education have a significant impact on English test score for both male and female YL children and as the years of education increases, *ceteris paribus*, English performance increases for male and female YL children with the coefficient of 0.297 and 0.348 units respectively. In other words, a number of years of education is positively associated with performance of YL child which is also evident in previous literature (Nagi and Sridevi, 2020).

The number of studies (Singh and Mukherjee, 2019; Nguyen, 2019, Espinosa, 2017; Considine and Zappala, 2002; Attavel and Battle, 2006; Alwin, 1991; Ernst and Angst, 1983; Farooq *et. al.*, 2011; Nagi and Sridevi. 2020) have established the influence of social background on the educational performance of the children. Unlike these studies, Table 3.3 shows that social background (SC and ST) does not have much influence on the English performance of the YL children. The regression coefficient for the dummy SC and ST for all samples as well as for both the genders is insignificant. Only OBC dummy is significant for the male children, which shows that English performance of the children from OBC category is lower by 0.610 unit compared to other categories male children. Hence , we can say that males from the OBC background perform lower than the males of other categories.

The available research (Kohn, 1969; Majoribanks, 1979; Heyns, 1978; Arteaga and Glewwe, 2014; Black, 1985; Chiu *et. al.*, 2016; Farooq *et al.*, 2011; Chinyoka and Naidu, 2014; Desai, 1994) shows that parental education and their involvement in academic activities of the children predict more about child's educational performance. The regression results in Table 3.3 reflect that father and mother's educational status have significant role in determining the English performance of YL children. The partial regression coefficient shows that as the educational qualification of mother increases by one unit, *ceteris paribus*, on an average educational performance for female would increase by 0.166 units. On an average, educational performance for male children would increase by 0.121 units as father's education level increases by one unit, keeping other factors constant. Similarly, for the whole sample, if mother's education increases by one unit, keeping other things constant, on an average, English score would increase by 0.100 units and if father's education level increase by one-unit, English score for the whole sample would increase by 0.090 units. The more interesting observation is

that mother's education is positively associated to the performance of the female children and it is insignificant for male children. On the other hand, the educational status of the father is significantly related with the performance of male children and insignificant for female children performance. Hence, the mother's education has more significant impact on female children's educational performance compared to their counterpart while the father's educational status is insignificant in our analysis.

We also find that the expenditure on schooling has a significant influence on the English performance of the YL child. The results show that the schooling cost is positively related to the English performance. This finding is in line with previous literature (Lin and Liv, 2012; Adzido *et. al.*, 2016; Kapur, 2018; Chinyoka and Naidu, 2014) where the same direction of influence is found. The partial regression coefficient for expenditure on education are 0.00002 for whole sample, male and female respectively. This indicates that if the expenditure on education, increases by one unit, keeping other things constant, on an average English score will increase by 0.00002 units for everyone. Hence, the total expenditure on schooling is influential determinant of English performance.

Many available research (Alwin, 1991; Blake, 1981; Jensen, 1980) claims that educational performance of the children is inversely related with the family size. On the same line, we found that household size is inversely affected the English performance of the YL children. The partial regression coefficient depicts, if the household size increase by one unit, *ceteris paribus*, for whole sample and male sub sample, on an average the English performance would decrease by 0.123 units and 0.150 units for whole sample and males, respectively. Contrary to this, household size is insignificant for female children in determining the English score.

The studies (Attewell and Battle, 1999) establish that availability of the computer at house significantly influence the educational performance of the children. Similarly, in our analysis we find that English performance is significantly influenced by the availability of the computer. We determine that keeping other factors constant, the average English test score will be higher by 0.814 units if a child has a computer at home compared to the children with non-availability of computer. Similarly, a male child performs 0.991 unit higher if there is availability of computer at home compared to the male children with non-availability of computer at home. On the other hand, it is insignificant for female children. Thus, the availability of the computer at house is positively associated with the English performance of the children.

3.4 Test for the Validity of Regression Analysis

This section of the chapter checks the validity of the regression model. To check the presence of multicollinearity in the model, VIF test has been used. Similarly, to assess the presence of heteroscedasticity, BP test has been utilized.

Table 3.4: Test for Multicollinearity of Children Studying in Public School

Variable	For Whole Sample		For Male		For Females	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Gender	1.09	0.913	-	-	-	-
Time to Study	1.47	0.683	1.38	0.725	1.61	0.622
Body Mass Index	1.05	0.956	1.06	0.944	1.04	0.962
Years of Education	1.76	0.568	1.72	0.583	1.81	0.552
SC	1.30	0.769	1.51	0.663	1.21	0.830
ST	1.16	0.862	1.25	0.798	1.15	0.870
OBC	1.34	0.745	1.54	0.651	1.16	0.860
Availability of Fellowship	1.38	0.727	1.48	0.674	1.31	0.762
Mother's Education	1.77	0.564	1.72	0.581	1.88	0.531
Father's Education	1.69	0.592	1.68	0.597	1.74	0.574
Expenditure	1.33	0.751	1.47	0.682	1.27	0.785
Household Size	1.08	0.927	1.08	0.924	1.08	0.922
Assets	1.17	0.851	1.21	0.826	1.17	0.857
Availability of Computer	1.17	0.851	1.22	0.823	1.19	0.838
Mean VIF	1.34		1.41		1.36	

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

3.4.1 Test for Multicollinearity

The presence of multicollinearity can be traced by VIF. When two or more explanatory variables have exact linear relationship between them then we have perfect multicollinearity if there is no collinearity between explanatory variables, the value of VIF will be one, however, if collinearity between explanatory variables increases, the value of VIF will also increase, and it can reach to infinity. Owing to the fact that the value of VIF for all the explanatory variables in Table 3.4 are less than five which makes the multicollinearity non-existent.

3.4.2 Test for Heteroscedasticity

Table 3.5 shows the results of the BP-test. After finding the F values of the model which is more than 0.05. The null hypothesis of homoscedasticity is not rejected. This means that the model does not fit or it can also be concluded that residual square is unrelated to the explanatory variables. We infer that in our dataset residuals are homoscedastic and there is no heteroscedasticity in the model.

Table 3.5: Result of BP test for the presence of Heteroscedasticity for public school

Residual Squared	Mathematics Score						English Score					
	For Whole Sample		For Male		For Female		For Whole Sample		For Male		For Female	
	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values
Gender	1.046	0.705	0		0		-0.401	0.709	0		0	
Time to Study	-1.811	0.070	-2.425	0.103	-2.038	0.123	0.031	0.935	0.420	0.375	-0.814	0.194
Body Mass Index	-0.443	0.308	0.086	0.902	-0.659	0.211	-0.070	0.679	-0.129	0.564	-0.040	0.872
Years of Education	-0.545	0.101	-1.218	0.029	0.171	0.669	-0.831	0.000	-1.024	0.000	-0.547	0.004
SC	-5.695	0.193	-5.946	0.382	-6.779	0.236	-2.268	0.183	0.262	0.904	-5.429	0.046
ST	-1.032	0.859	-7.054	0.429	7.098	0.349	-3.430	0.128	0.106	0.970	-6.281	0.081
OBC	-5.500	0.081	-6.615	0.188	-7.289	0.067	-0.376	0.758	2.030	0.205	-2.168	0.250
Availability of Fellowship	-1.543	0.619	1.994	0.686	-4.943	0.200	-0.162	0.893	0.195	0.901	-0.714	0.697
Mother's Education	-0.107	0.803	0.474	0.474	-0.794	0.146	0.172	0.301	0.409	0.054	0.034	0.897
Father's Education	0.029	0.934	-0.384	0.468	0.544	0.239	-0.146	0.288	-0.430	0.011	.0200	0.361
Expenditure	0.000	0.272	0.000	0.562	7.38e-06	0.908	-0.000	0.354	-0.000	0.182	-2.89e-06	0.924
Household Size	0.744	0.331	10.222	0.238	-0.316	0.785	-0.127	0.669	-0.023	0.945	-0.151	0.783
Assets	-0.000	0.212	-0.000	0.292	-0.000	0.390	0.000	0.510	0.000	0.438	-0.000	0.747
Availability of Computer	0.225	0.972	14.246	0.188	-6.941	0.369	-4.206	0.094	-0.878	0.799	-6.207	0.091
Constant	44.823	0.000	39.996	0.014	49.327	0.000	22.016	0.000	22.557	0.000	19.939	0.001
Number of obs.	809		404		405		809		404		405	
F	1.58 (14, 794)		1.44 (13, 390)		1.50 (13, 391)		6.82 (14, 794)		5.64 (13, 390)		3.16 (13, 391)	
Prob.>F	0.0794		1.1363		0.1157		0.0000		0.0000		0.0002	
R-squared	0.0271		0.0459		0.0474		0.1074		0.1583		0.0950	
Adj. R-squared	0.0099		0.0141		0.0157		0.0916		0.1302		0.0649	
Root MSE	37.54		40.642		35.545		14.593		12.956		15.921	

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

3.5 Gender-based Mean Difference among Variables: A Non-Parametric Approach

This segment of the chapter analyses gender based mean difference by using a non-parametric approach. A t-test is being used to analyse the gender based mean difference for all variables individually.

Table 3.6: Gender based means of variables

Variables	Overall	Male	Female	Difference
Mathematics Test Score	14.744 (6.878)	16.062 (6.767)	13.43 (6.742)	2.632***
English Test Score	15.413 (4.216)	16.064 (3.902)	14.763 (4.417)	1.301***
Time to study	1.349 (1.604)	1.384 (1.605)	1.314 (1.605)	0.070
Body Mass Index	19.581 (3.106)	19.386 (2.964)	19.775 (3.234)	-0.389**
Years of Education	10.354 (5.273)	11.047 (4.786)	9.662 (5.638)	1.385***
SC	0.137 (0.344)	0.158 (0.366)	0.116 (0.321)	0.042**
ST	0.064 (0.245)	0.069 (0.254)	0.059 (0.236)	0.010
OBC	0.383 (0.486)	0.478 (0.500)	0.289 (0.454)	0.189***
Availability of Fellowship	0.478 (0.500)	0.522 (0.500)	0.435 (0.496)	0.088***
Mother's Education	3.125 (4.105)	2.980 (4.011)	3.269 (4.196)	-0.289
Father's Education	5.068 (4.873)	4.814 (4.958)	5.321 (4.778)	-0.507*
Expenditure	15896.79 (29044.42)	18161.36 (28374.13)	13637.81 (29560.35)	4523.554**
Household Size	4.705 (1.792)	4.785 (2.037)	4.625 (1.507)	0.160
Assets	15399.89 (29524.98)	16405.68 (36848.41)	14396.59 (19671.91)	2009.088
Availability of Computer	0.052 (0.222)	0.045 (0.207)	0.059 (0.236)	-0.015

Note: *p<.1, **p<.05, ***p<.01 and Standard deviations are in parentheses.

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Table 3.6 indicates that the average value of the majority of the variables have significant differences based on gender. The average Mathematics test scores have a significant difference and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 16.39 percent, and the difference is statistically vital. The average English test scores have a significant difference and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 8 percent, and the difference is statistically important.

The average BMI for female children is higher than the average BMI of male children by 2 percent. The female children have lesser average years of education by almost one and half years compared to male children. The gap between the proportion of SCs among male and female is significant, which is 4.2 percent. Similarly, the gap between the proportion of OBCs among male and female is significant, which is 18.9 percent. The variable availability of fellowship is different and statistically significant, and almost 8.8 percent more male children have the availability of fellowship compared to female children. The results show that female children's parents are much more educated than male children's parents, as can be seen from the average years of education of fathers, which is higher for female children than male children by almost 10.5 percent. The average expenditure on education has a significant difference and it shows that the average expenditure on education for female children are less than the average expenditure on education for male children by almost 25 percent. We see that the average values of the background variables are better for male children. In the following section, we attempt to find whether these differences influence the difference in the average test score between male and female.

3.6 Factors Causing Gender Gap in Performance

As evident from earlier calculations, the gender dummy has a significant impact on the educational performance of the children. Hence, the dataset is subdivided into two groups, namely, male children and female children. While using the regression method, results for variable gender show a significant impact on the educational performance of children. Few other significant results were found between the variables of males and females which are shown in Table 3.2 and 3.3. The descriptive statistics are shown in Table 3.7 and Table 3.8 for males and females, respectively.

To determine the contribution of variations in predictors across groups to the overall outcome differences, we have used equation (1.4) from chapter 1 i.e.

$$R = \{E(X_M) - E(X_F)\}'\beta_F + E(X_F)'(\beta_M - \beta_F) + \{E(X_M) - E(X_F)\}'(\beta_M - \beta_F) \dots (4.1)$$

Above equation is a “threefold” decomposition, that is, the outcome difference is segregated into three segments,

$$R = E + C + I$$

The first component,

$$E = \{E(X_M) - E(X_F)\}'\beta_F$$

amounts to the part of the differential due to group differences in the predictors (the “*endowments effects*”). It measures the test score gap occurred due to the difference in the background characteristics of male and female child that apply to the impact of a female children.

The second component,

$$C = E(X_F)'(\beta_M - \beta_F)$$

measures the contribution of differences in the coefficient (including differences in the intercept).

And the third component,

$$I = \{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$$

is an interaction term accounting for the fact that differences in endowments and coefficient exist simultaneously between the two groups. The third term, $\{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$ calculates the contribution to the performance gap of difference between male and female students in the impact of background characteristics on test score, applied to the difference in the average characteristics of male and female students $\{E(X_M) - E(X_F)\}$.

The decomposition equation (4.1) is derived from the perspective of Group F. The group difference in the predictors is laden by the coefficients of Group F to analyse the endowments effect (E). The E calculates the expected variation in Group F's mean outcome if Group F had Group M's predictor levels. Correspondingly, for the C, the dissimilarities in coefficients are laden by Group F's predictor levels. That is, the C component tests the expected variation in Group F's mean outcome if Group F had Group M's coefficients.

The Table 3.7 and 3.8, showing the descriptive statistics of the male and female children. Table 3.6 indicate that the average Mathematics and English test score for male children is greater than average test score scored by female children in both the subjects. On the same line, on an average a greater number of male children are having fellowship compared to the female children. Similarly, the amount spent on education in a year is more for male children compared to the female children. Additionally, the amount of household assets is more for the male children compared to the female children.

3.6.1 Subject-wise Average Marks Scored by Students

This portion shows subject –wise marks score by both male and female students. The Average marks scored in subjects are represented in the graphs. As shown in Figure 3.1 that the average marks scored by the students, in both mathematics and English is 14.74 and 15.41 respectively. It is also reflected that the average marks score by Male students in both Mathematics and English subject is lower for female students compared to the overall average score and it is even lower compared to the male students for both Mathematics and English. In other words, on an average male student scored about 16marks in both Mathematics and English whereas female students scored about 13 and 14.76 marks in Mathematics and English, respectively.

3.6.2 Gender-wise Students from Different Social Groups

This segment of the chapter reflects the gender-wise participation of students in school from different marginalized groups such as SC, ST, and OBC. Figure 3.2 indicates enrollment in school based on ethnicity (Social background), it shows that the overall percentage of students belong to the SC, ST, and OBC background is 13.7, 6.4, and 38.3 percent, respectively. There is a visible gap based on the gender for the percentage of the different social groups in the school. The percentage of male students from different social groups are more compared to the female students from the respective social groups. The percentage of male students from SC, ST, and OBC background is 15.8, 6.9, and 47.8 whereas the percentage for female students from SC, ST, and OBC background is 11.6, 5.9, and 28.9. The participation of female students from different social groups are lower compared to overall participation and it is even lower when compared to male students from respective social groups. It is also reflected in the Figure that almost half of the male students belong to the OBC group.

3.6.3 Percentage of Students availing Fellowship and Computer at Household

This section of the chapter displays the percentage of the students having availability of fellowship and the percentage of the students having availability of the computer at household. Figure 3.3 shows the percentage of the students having availability of the fellowship and computer at household. It is visible that almost half of the students in school are not having availability of fellowship. 52.2 percent of the male students are having fellowship whereas 43.5 percent female students are having fellowship which is lower than the male students. The availability of the computer at household shows the alarming situation. Only 5 percent of the students are having availability to the computer at household. Where the literature shows that the availability of the computer household significantly influences the performance of the child. It is also shown in the previous literature that expenditure on education and household assets or wealth has a significant impact in determining the educational performance of the child.

3.6.4 Gender-wise Average Expenditure on Education and Value of Household Assets

This subsection of the chapter shows the gender-wise average expenditure on education by the family in an academic year. It also presents the average value of the five most valuable assets in the household. Figure 3.4 indicate that the Average expenditure on the education of the students is ₹15897. Expenditure on education for male is more than the female students. On the other hand. The Value of the household assets for the male students is greater than the household value of the assets for female students. On an average, in an academic year, a family spent ₹18161 on education for the male students where only ₹14397 for the female students which is lower than the male students.

Table 3.7: Descriptive Statistics for Male Children

Variable	N	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
Mathematics Test Score	404	16.062	17	0	29	6.758	-.0430	2.421
English Test Score	404	16.064	17	0	22	3.902	-0.961	4.198
Time to Study	404	1.384	1	0	12	1.605	1.739	8.699
Body Mass Index	404	19.386	18.882	13.119	31.992	2.964	1.364	5.746
Years of Education	404	11.047	13	0	15	4.786	-1.706	4.321
SC	404	0.158	0	0	1	0.366	1.871	4.501
ST	404	0.069	0	0	1	0.254	3.392	12.503
OBC	404	0.478	0	0	1	0.500	0.892	1.008
Availability of Fellowship	404	0.522	1	0	1	0.500	-0.089	1.008
Mother's Education	404	2.980	0	0	14	4.011	1.093	3.021
Father's Education	404	4.814	4	0	14	4.958	0.473	1.751
Expenditure	404	18161.36	7250	0	190000	28374.13	2.910	13.569
Household Size	404	4.785	4	1	26	2.037	3.639	32.432
Assets	404	16405.68	5500	300	500000	36848.41	8.986	105.058
Availability of Computer	404	0.045	0	0	1	0.207	4.415	20.491

Source: Author's own interpretation using YLS data, for older cohort for India, 2013.

Table 3.8: Descriptive Statistics for Female Children

Variable	N	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
Mathematics Test Score	405	13.430	14	0	28	6.742	-0.069	2.104
English Test Score	405	14.763	16	1	22	4.417	-0.641	2.932
Time to Study	405	1.314	0	0	9	1.605	1.081	3.922
Body Mass Index	405	19.775	19.124	14.128	35.145	3.234	1.402	6.044
Years of Education	405	9.662	12	0	16	5.638	-1.006	2.268
SC	405	0.116	0	0	1	0.321	2.398	6.748
ST	405	0.059	0	0	1	0.236	3.733	14.938
OBC	405	0.289	0	0	1	0.454	0.932	1.868
Availability of Fellowship	405	0.435	0	0	1	0.496	0.264	1.070
Mother's Education	405	3.269	0	0	14	4.196	0.956	2.614
Father's Education	405	5.321	5	0	14	4.778	0.271	1.674
Expenditure	405	13637.81	4300	0	442200	29560.35	8.435	112.342
Household Size	405	4.625	4	1	13	1.507	0.980	5.873
Assets	405	14396.59	6000	100	150000	19671.91	2.855	13.725
Availability of Computer	405	0.059	0	0	1	0.236	3.733	14.938

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Figure 3.1: Subject-wise Average Marks Scored by Students

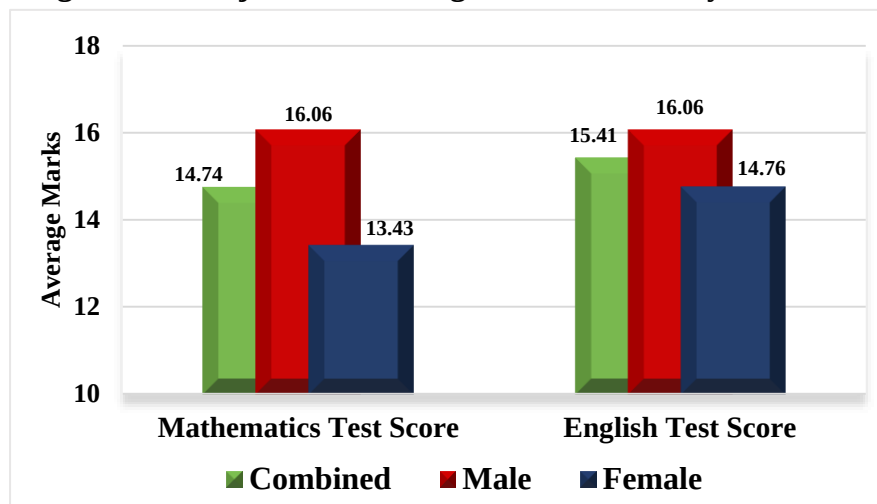


Figure 3.2: Gender-wise Students from Different Social Groups

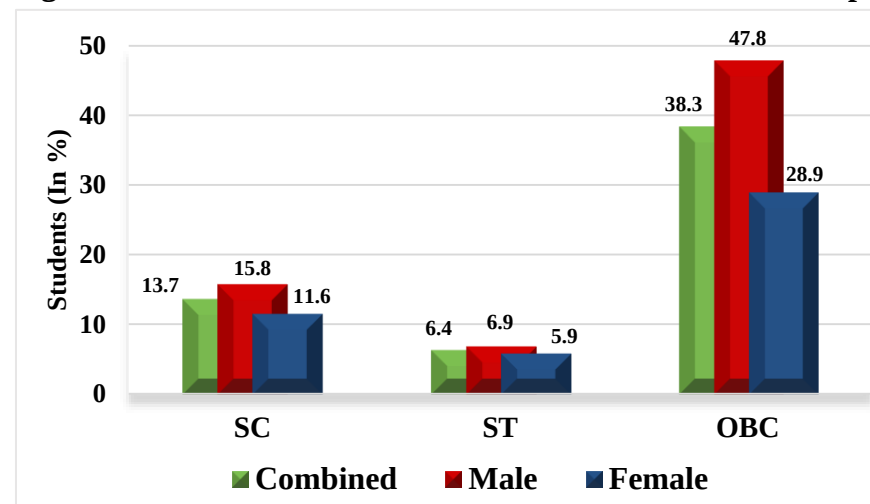


Figure 3.3: Percentage of Students availing Fellowship and Computer at Household

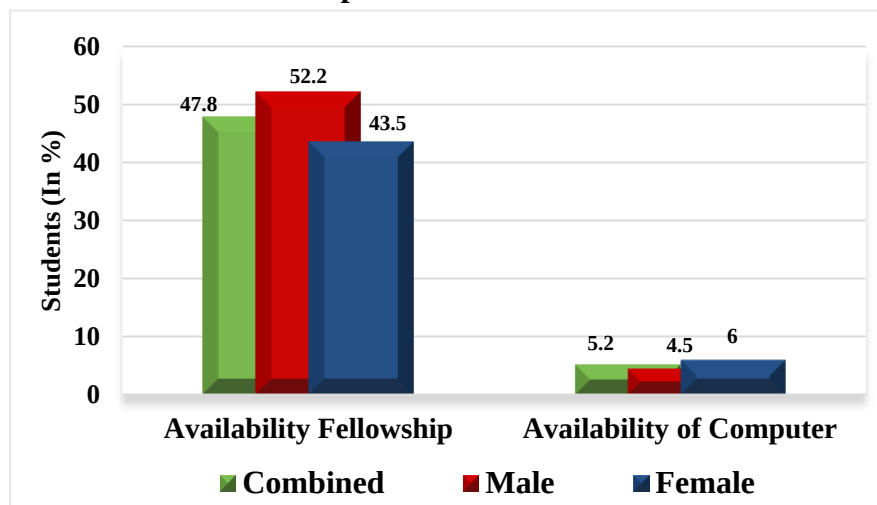
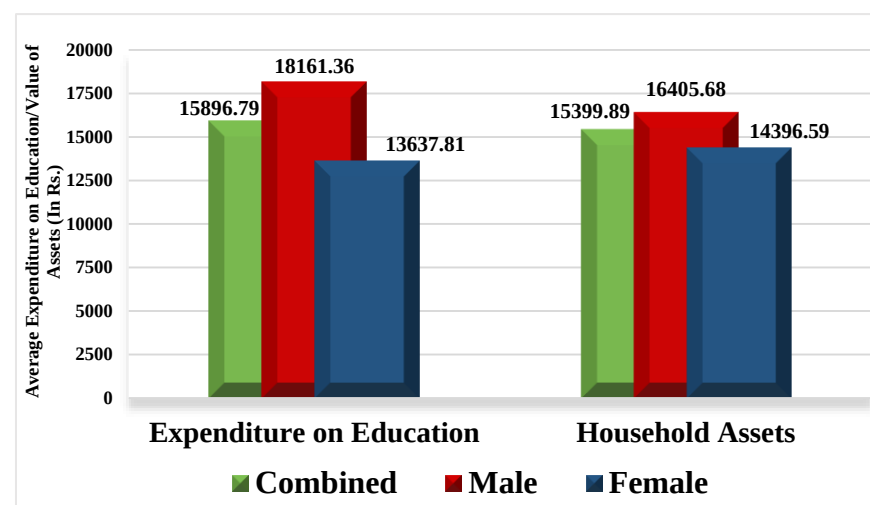


Figure 3.4: Gender-wise Average Expenditure on Education and Value of Household Assets



Source: Calculated using YLS data for older cohort for India, 2013.

3.7 Contribution of the Factors in Performance Gap

This portion of the chapter shows the factors contributing gender-gap by using Blinder-Oaxaca methodology for decomposition. The result of the Oaxaca-Blinder decomposition (equation 4.1) is shown in Table 3.9. The Mathematics test score difference between male and female children is 0.383 standard deviations. We see that this difference, total 0.383 standard deviation, is primarily and only because of the coefficient effect (significant at 1 percent level of significance). The contribution of this effect is 72.58 percent of the total difference or 0.278 standard deviation out of 0.383 standard deviations. Similarly, the English test score difference between male and female children is 0.309 standard deviation. The endowment and coefficient effect are significant at 5 percent and 1 percent of level of significance, respectively. The difference, total 0.309 standard deviation, is mainly because of the endowment and coefficient effect. The endowment and coefficient effect contribute almost 35.28 percent and 80.26 percent of the total difference, respectively.

The first section of the decomposition outcomes shows the mean prediction by groups and their gap. In our analysis, the mean of Mathematics test score is 2.335 for male and 1.952 for female children, leading to a performance gap of 0.383 for Mathematics. Similarly, the mean of English test score is 3.810 for male and 3.502 for female children, resulting in a 0.309 gap in performance. In the second panel of the decomposition output splits the performance gap into three parts. The first part depicts the mean increase in the female children's performance if they had the same characteristics as male children. The second term measures the variation in female children's performance when applying the male's coefficient to the female's characteristics. The third part is the intersection term that calculates the simultaneous effects of difference in endowments and coefficient effect. Even though we have found that the average values of the variables are significantly different (Table 3.6) and better for male children, this difference does not explain or contribute to the difference in the average scores between them. What it does explain is the contrast in the average impact or returns to the average values of those background characteristics. In other words, the variation in the extent of pressure put upon the test score explains 72.58 percent (1.915 out of the total difference of 2.632) of the mean performance difference between males and females.

The endowment effect (i.e., the difference between the two groups in the mean values of the child) has almost no effect (0.071 standard deviation: not statistically different from zero).

The English test score difference between male and female children is 0.309 standard deviation. We see that this difference, total of 0.309, is primarily because of the endowment and coefficient effect. The contribution of the endowment and coefficient effect is 35.28 percent and 80.26 percent of the total difference or 0.109 and 0.248 out of 0.304 standard deviations. The endowment effect portrays that the significant difference in the average value of the background characteristics explain 35.28 percent of the total difference in the English test score between the male and female children. Our results also reflect if the average features for both the groups were similar as male children, the performance score for the females would have increased by 0.46 points. We have found that the average values of the variables are significantly different and better for male children, this difference explains 35.28 percent of the total difference in the average scores between them. Moreover, the coefficient effect reflects that the differential returns to the background characteristics explain 80.26 percent of the total difference. It explains the distinct contrast in the average impact or returns to the average values of the background characteristics. In other words, the variation in the extent of pressure put upon the test score explains 80.26 percent of the mean performance difference between males and females. The entire variation between the average test scores of males and females is explained in our results.

Table 3.9: Blinder-Oaxaca Decomposition Results for Mathematics and English Test Score

	For Mathematics Test Score			For English Test Score		
	Coefficient		P value	Coefficient		P value
	Raw Test score	Standardized Test Score		Raw Test score	Standardized Test Score	
Male	16.062	2.335	0.000	16.064	3.810	0.000
Female	13.430	1.952	0.000	14.763	3.502	0.000
Difference	2.632	0.383	0.000***	1.301	0.309	0.000***
Endowment Effect $\{E(P_M) - E(P_F)\}'\beta_F$	0.491	0.071	0.136	0.460	0.109	0.037**
Coefficient Effect $E(P_F)'(\beta_M - \beta_F)$	1.915	0.278	0.000***	1.048	0.248	0.000***
Interaction Effect $\{E(P_M) - E(P_F)\}'(\beta_M - \beta_F)$	0.226	0.033	0.389	-0.207	-0.049	0.177

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

3.7.1 Factors Contributing to Gender-Gap in Mathematics Performance

This section of the chapter talks about the variables contributing to the gender gap in Mathematic performance. The detailed Blinder-Oaxaca decomposition results are shown in Table 3.10 for mathematics test score. We have discussed before that the endowment effect is not statistically significant in our results. However, the coefficient is significant at 1 percent levels of significance.

Table 3.10: Detailed Blinder-Oaxaca Decomposition for Mathematics Test Score

	Mathematics Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to Study	0.011	0.538	-0.050	0.362	-0.003	0.608
Body Mass Index	0.005	0.351	0.826	0.021**	-0.016	0.159
Years of Education	0.059	0.004	0.323	0.018**	0.046	0.044
SC	-0.011	0.187	0.012	0.551	0.005	0.571
ST	-0.003	0.581	0.0002	0.993	0.00002	0.993
OBC	0.003	0.821	-0.004	0.918	-0.003	0.918
Availability of Fellowship	0.006	0.462	-0.029	0.604	-0.006	0.612
Mother's Education	-0.010	0.347	-0.068	0.245	0.006	0.447
Father's Education	-0.005	0.434	-0.038	0.627	0.004	0.644
Expenditure	0.020	0.076	0.025	0.392	0.009	0.423
Household Size	0.001	0.841	-0.139	0.368	-0.005	0.463
Assets	-0.002	0.701	-0.017	0.635	-0.002	0.670
Availability of computer	-0.003	0.514	0.008	0.627	-0.002	0.664
Total (N= 809)	0.071	0.136	0.278	0.000	0.033	0.389

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

The entirety of the coefficient effect is explained by the BMI and years of schooling a child has received at the fourth round of the survey. BMI and years of schooling, both are significant at 5 percent of level of significance. We find BMI and years of schooling contribute 297.12 and 116.19 percent of the total coefficient effect, respectively. In other words, out of the total difference of 0.278 standard deviation, BMI and years of schooling contribute 0.826 and 0.323

standard deviation to coefficient effect, respectively. A large part of the coefficient effect is offset by the negative effect of the other factors on the outcome variable, such as household size. We find that BMI and years of schooling a child has received at the time of the survey play a crucial role in explaining the difference in the average Mathematics score based on gender. We also learn that there are differential returns to the same average years of schooling based on gender.

Similarly, there are differential returns to the same average BMI based on gender. For both the BMI and years of schooling, returns are greater for the male children compared to female children. Most of the previous literature, particularly in India, has not measured the extent to which BMI and years of schooling are causing gender gap. Hence, this inclusion in our analysis shows that these variables play a particularly important role in the Mathematics score of a child.

3.7.1 Factors Contributing to Gender Gap in English performance

This segment analyses the variables contributing the gender-gap in achievement levels in English of the students. Table 3.11 show the outcome of the detailed Blinder-Oaxaca decomposition. We have discussed before that the endowment effect and coefficient effects are statistically significant in our results. However, the endowment effect is significant at 5 percent level of significance. The majority of the endowment effect is explained by years of education a child has received during the fourth round of the data and expenditure on education. Years of schooling and expenditure on education are significant at 1 percent and 5 percent of levels of significance, respectively. We find years of schooling and expenditure on education contribute 104.58 and 15.59 percent of the total endowment effect. In other words, out of the total difference of 0.109 standard deviation, years of schooling and expenditure on education contribute 0.114 and 0.017 standard deviation to endowment effect, respectively. Moreover, the coefficient is significant at 1 percent levels of significance. In coefficient effect the variable mother's education is significant at 10 percent level of significance. The entirety of the coefficient effect is explained by the mother's education level at the time of the fourth round of the survey. We find it is just the mother's education received at the time of the survey, which plays a crucial role in explaining the difference in the average English test score based on gender. We also learn that there are differential returns to the same average mother's education based on gender, where it is greater for the male children compare to the females. Most of the previous literature has neither discussed nor included the mother's education variable. This

inclusion in our analysis shows a particularly important role in the English performance of a child.

Table 3.11: Detailed Blinder-Oaxaca Decomposition for English Test Score

	English Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to Study	0.005	0.548	-0.005	0.931	-0.0002	0.932
Body Mass Index	-0.002	0.704	0.344	0.324	-0.007	0.388
Years of Education	0.114	0.001***	-0.119	0.367	-0.017	0.380
SC	-0.008	0.289	0.008	0.787	0.003	0.694
ST	-0.0005	0.798	0.0008	0.956	0.0001	0.956
OBC	0.011	0.523	-0.059	0.116	-0.039	0.128
Availability of Fellowship	-0.002	0.805	0.022	0.694	0.004	0.697
Mother's Education	-0.011	0.341	-0.985	0.086*	0.009	0.386
Father's Education	-0.005	0.408	0.096	0.213	-0.009	0.340
Expenditure	0.017	0.098**	0.022	0.453	0.007	0.476
Household Size	-0.002	0.683	-0.110	0.469	-0.004	0.530
Assets	-0.006	0.434	0.031	0.367	0.004	0.509
Availability of computer	-0.002	0.554	0.006	0.715	-0.001	0.733
Total (N= 809)	0.109	0.037	0.248	0.000	-0.049	0.177

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

3.8 Conclusion

In this chapter, we have used the fourth round of Young Lives Survey data, India (erstwhile Andhra Pradesh), for the older cohort. We attempted to understand and explain the educational performance gap between male and female children using the variety of their background characteristics. We tried to analyse attributes that explain the average Mathematics and English performance gap between male and female children. Through the initial regression analysis, we found a significant difference in the performance of the male and female children, where males outperformed females. We then divided our data set into two groups, males and females for both the subjects. Looking at the average values of the background characteristics, we

noticed that males have significantly better characteristics compared to females. Using the threefold Oaxaca-Blinder decomposition, for Mathematics, we found that majority of the performance difference between them is because of the coefficient effect or the differential returns to the background characteristics. In this effect, it is the BMI and years of schooling a child has received, which contributed significantly.

And for English, we find that majority of the performance difference between them is because of the difference in the average value of the background features (endowment) and the differential returns to the background characteristics (coefficient effect). The contribution of the endowment and coefficient effect is 35.28 percent and 80.26 percent of the total difference. In coefficient effect, it is mother's education and in endowment effect, it is the years of schooling a child has received and expenditure on education a family has done at the time of the fourth round of survey, which contributes significantly.

Similar to previous findings in various countries (Nagi and Sridevi, 2020; Singh and Krutikova, 2017; Dickerson *et al.*, 2015; Arteaga and Glewwe, 2014; Legewie and Diprete, 2012; Farooq *et al.*, 2011; Maddah *et al.*, 2003; Collins *et al.*, 2000; Kingdon, 1996), we found that a child's gender has a significant role to play in Mathematics performance. In addition to these studies, we also delved into these children's background characteristics based on gender to identify specific factors responsible for the gender-based difference in educational performance (both Mathematics and English). Earlier studies have analyzed the effect of different background characteristics such as health, expenditure on education and parental education on performance. Our study not only measures the gender gap but also analyses the background characteristics which is causing this gap and calculating the contribution of the background features like BMI, years of schooling, mother's education and expenditure on education.

Our study points out at two directions. Firstly, on the exploratory side, it seeks to further figure out certain gender-based intricacies. As we have found a differential impact with respect to the same level of background characteristics based on the gender of the child, it would be interesting to investigate how and why it is so and what makes a male child different from the female child apart from above-discussed background characteristics.

Based on the findings, the government needs to identify the shortcomings at the policy level. Necessary measures need to be taken that focus on the nutritional values of the school-going children. In this regard, the government can provide nutritious food under the mid-day meal programme. It is also essential to check the dropout level of the school-going children,

specifically for the female child. To prevent the girl child from dropping out of school, the government can provide incentives in the form of financial assistance and other grants (stationary, uniforms, books) to help them in pursuing their further education.

Chapter-IV

Gender Gap in Academic Performance in Public and Private Schools: An Analysis of Young Lives Survey for India

“Education is as necessary for female as it is for males. If you know how to read and write, there would be much progress. As you are, so your children will be mould their lives in virtuous way, for sons should be such as would make a mark in this world”.

Dr. B. R. Ambedkar

Abstract

Education is acknowledged as a significant measure and one of the essential means for uplifting women. The researchers have identified gender as one of the significant factors along with other household factors and parental education in children's academic performance. The relation between the type of school and educational performance has become a field of debate in India. Data shows that 59.5 percent of the 6-14 years old children enrolled in private schools. Using the Young Lives longitudinal sample of older cohorts for India, the study analyses which type of school has a more significant gender gap in educational performance and the variables causing this gender gap. The study found a gender-based gap in Mathematics learning outcomes for both public and private school children. The gender gap in learning outcomes is lesser in private schools compare to public school children. In the case of public schools, for both Mathematics and English, study shows that majority of the performance difference between them is due to the differential returns to the background characteristics. However, the coefficient effect is significant for Mathematics, but the results do not explain what factors contributes to the coefficient effect.

On the other hand, for English test score, the household size contributes significantly. Similarly, in private schools, the result shows that the majority of the performance difference for Mathematics test score between genders is because of the differential returns to the background characteristics (coefficient effect). The study finds differential returns to the same average years of education and Mother's education for Mathematics Performance based on gender. Contrary to it, for English test score, the difference between male and female children is insignificant.

4.1 Introduction

The National Achievement Survey (NAS-2014) shows a critical contrast across states in the average level of students' performance. The same study by NAS-2014 found that sex-based distinction is noticeable for the province of Andhra Pradesh in instructive accomplishment. There is a gender gap in Reading and mathematics. Where girls outperform the boy in text and boys perform better than girls in Mathematics. The pitiful condition of women has its first establishment in the numbness of guardians who neglect to educate their daughter (Desai, 1994). On a different line, Ghosh (2011) claims that the behavioral pattern of parents plays a significant role in educational level of child; if the parents are perfect capitalists in nature, they will revolve around profit/benefit, and they will incline toward a male child. Most researchers identify gender as a significant factor in children's academic achievement. For instance, in Australia and Germany, the gender gap prevails in educational performance (Collin *et al.*, 2000; Legewie and Diprete, 2012). Males perform better irrespective of the type of school (Kingdon, 1996) and score higher in Reading and Mathematics (White *et al.*, 2016). On the contrary, females outperform males (Farooq *et al.*, 2011) in Pakistan. However, research of rural and urban Pakistan argued that performance is not influenced by gender (Jamil *et al.*, 2016). While it has been primarily established and agreed that there is a gender-based academic performance gap, it is also essential to look into the other factors that contribute to this discrepancy. Gender and type of school influence students' Mathematics achievement (Saleh and Rehman, 2016; Okyere, 2019). Similarly, Ali and Faaz (2017) revealed that study habits affect educational achievement positively. In recent years, the relation between the type of school and educational performance has become a field of debate in India, which depicts an actual private school effect (Goyal, 2009). Many studies, argued that performance of the students varies with the type of school, for instance, private school students perform better (Goyal and Pandey, 2009; Chudgar and Quin, 2012) and score higher in Mathematics and Reading compared to public school students (White *et al.*, 2016). Similarly, private schools influence English scores in rural India (Singh, 2015).

As discussed above, existing literature suggests that there is a gender-based disparity in the educational performance of school-going children. The first objective of this study is to analyse whether gender gap in educational performance exists in both public and private schools. The second objective is to identify which school has a more significant gender disparity in educational performance and what are the variables causing this gender disparity in educational performance.

4.2 Statistical Description with Respect to Type of Schools

This section discuss the source of the data used in the study. The study used the fourth round of data for India (Andhra Pradesh) and the older age cohorts. The fourth round has covered 952 children. The information required for the variables were available for 651 observations. Data shows that 323 children are enrolled in private (unaided) schools, 2 children are enrolled in NGO/Charity/Not for Profit type of schools. 257 children were enrolled in Public (government) schools. 2 were enrolled in Informal or no formal community schools and one was enrolled in a charitable trust. 62 children were enrolled in a mix of public and private (private aided) schools. For 3 children the type of school was not clear and information was not available for one observation. The study has included NGO/Charity/Not for Profit, Informal or non-formal community and charitable trust in public type of school based on the non-profit and aiding nature. On the other hand, private school include Private (Unaided) and Mix of public and private school (Private aided) as these schools are aided by private sources. Study has dropped the observation where the information about the type of school and source of aid was not available. Total 647 observations were finalised out of which 262 children enrolled in public school and 385 in private schools.

This section discuss the variables used for the study. Based on the objectives of the study and existing findings, variables are categorised into three categories, i.e., child-specific features, parental education, and household features. The descriptive statistics about the variables are presented in Table 4.1.

As shown in Figure 4.1, the average marks scored by students enrolled in private schools, in both Mathematics and English, is more than the students enrolled in public schools. In other words, an average student enrolled in private school scores about 18 marks in Mathematics and 17 marks in English, whereas students enrolled in public school 14 and 15 marks in Mathematics and English, respectively. Figure 4.2 reflect, 112 Male and 109 female students are enrolled in public school. Figure 4.2 shows, 173 male and 126 female students are enrolled in private schools. To put it another way, it is visible that the gender gap in enrollment is more in private schools - more male students are enrolled in private schools than female students. Body Mass Index was shown in Figure 4.3 for the children enrolled in public and private school. The value of BMI for both the school children is almost same. Figure 4.4 indicates enrollment in type of school-based on ethnicity (Social background), it shows that the

participation of SC and ST students in private school is 11.4 and 5.7 percent, respectively, which is less than that of public school.

Interestingly, more students from OBC backgrounds are enrolled in private schools than public schools. Half of the private school students and one third of the students enrolled in public schools are from OBC background. Figure 4.5, average time spent on study apart from the schooling hours is more for the private school students. The reason for difference is that the students enrolled in private school are also taking private tuitions.

This section shows the average years of schooling received by a child and highest level of schooling achieved by the parents. The average years of schooling received by a child enrolled in private school are almost lower by a year compared to those enrolled in public school (Figure 4.6). It indicates that the student enrolled in public school drop their school earlier than the private school student. Figures also indicate that public school students receive almost 6 times and four times more years of education than their mother and father, respectively. A similar trend is noticed for the private school students, where students receive four times and twice more years of education compared to their mother's and father's education, respectively. Noticeably, parental education of the public school going children are lower than the private school-going children.

Availability of the fellowship and computer is indicated in Figure 4.7. It indicates that less than 1 percent of students enrolled in public school have availability of computer at household. On the other hand, 10 percent of private school students have availability of computer at household. same percentage of the students have availability of the fellowship irrespective of the type of school. Previous studies have established that expenditure on education and value of household assets (wealth) plays a vital role in the children's educational performance. Expenditure on education and household wealth plays a vital role in educational performance. This section shows the school-wise average value of expenditure and assets in a household. Figure 4.8 indicates that the average expenditure on education of students enrolled in private school is almost five times higher than the expenditure on public school students by parents. Similarly, the value of the household assets is more for the private school student compared to the public school-going student.

Table 4.1: Descriptive Statistics for English and Mathematics for the Children Enrolled School

Variable	N	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
Mathematics Test Score	647	16.210	17	0	29	6.262	-0.353	2.439
English Test Score	647	16.476	17	4	22	3.369	-0.607	3.097
Gender	647	0.532	1	0	1	0.499	-0.127	1.016
Time to Study	647	1.675	2	0	12	1.630	1.207	6.107
Body Mass Index	647	19.509	18.901	13.119	35.145	3.102	1.445	6.275
Year of Education	647	12.867	13	9	16	1.473	-0.540	2.546
SC	647	0.139	0	0	1	0.346	2.086	5.350
ST	647	0.074	0	0	1	0.262	3.250	11.559
OBC	647	0.402	0	0	1	0.491	0.400	1.160
Availability Fellowship	647	0.577	1	0	1	0.494	-0.310	1.096
Mother's Education	647	3.505	1	0	14	4.251	0.851	2.452
Father's Education	647	5.606	5	0	14	4.966	0.218	1.605
Expenditure	647	19461.03	8250	0	442200	31368.16	5.427	57.604
Household Size	647	4.682	4	1	26	1.831	3.415	32.768
Assets	647	15768.96	6000	100	500000	31543.74	9.248	123.516
Availability of Computer	647	0.062	0	0	1	0.241	3.639	14.241

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Figure 4.1: Subject-Wise Average Marks of the Students in Schools

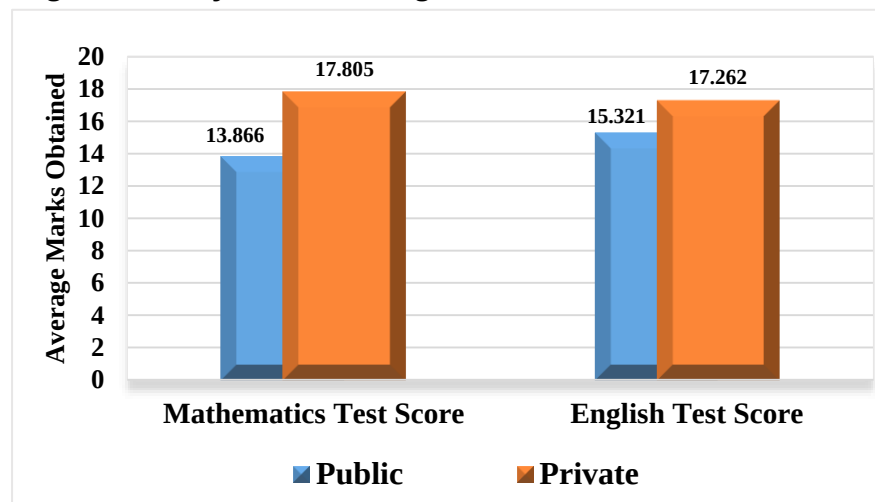


Figure 4.2: Gender-Wise Number of Students in School

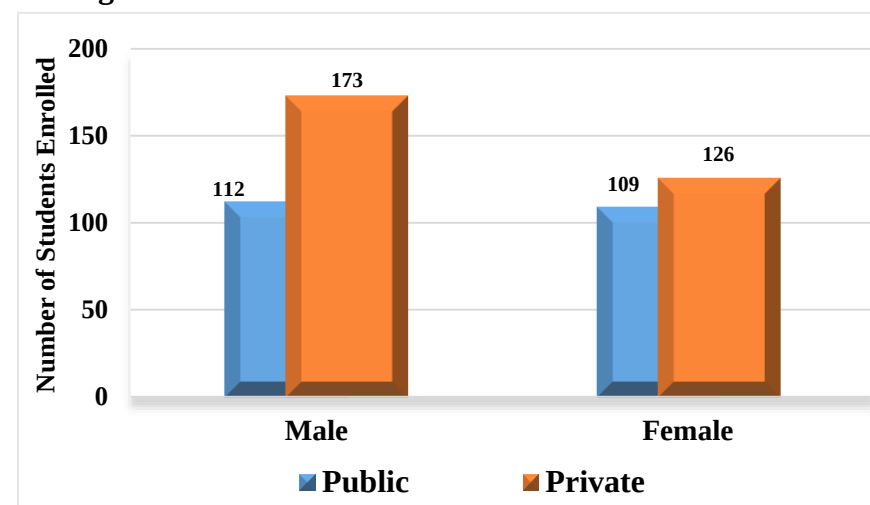


Figure 4.3: Average Body Mass Index of a Student Enrolled in School

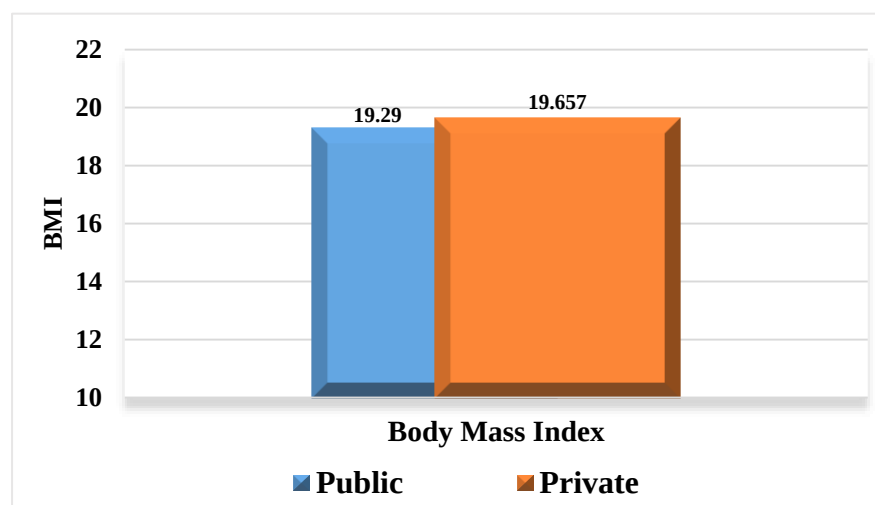
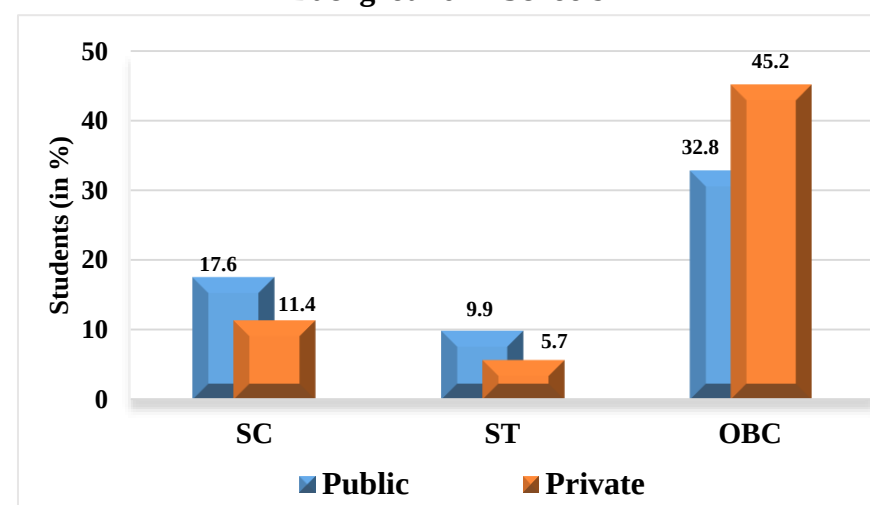


Figure 4.4: Percentage of Students from Different Social Background in Schools



Source: Calculated using YLS data for older cohort for India, 2013.

Figure 4.5: Average Hours Spent on study apart from School Time by a Student

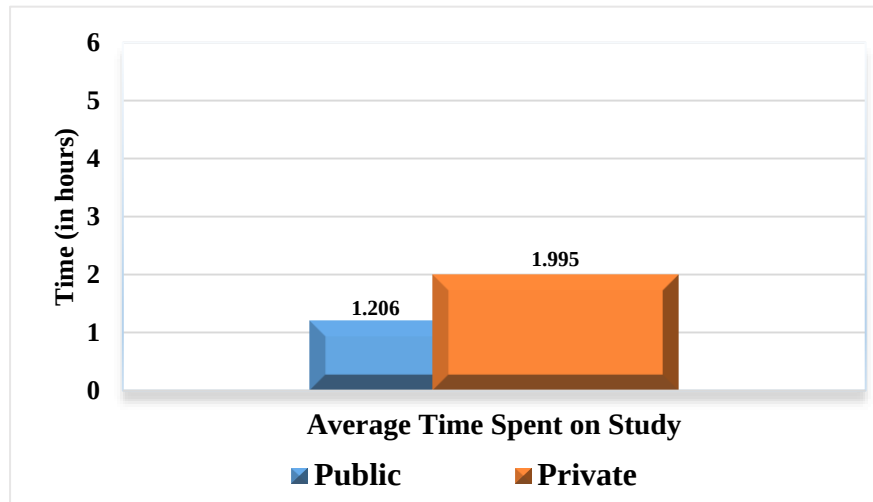


Figure 4.6: Years of Education Received by a Student and Parents

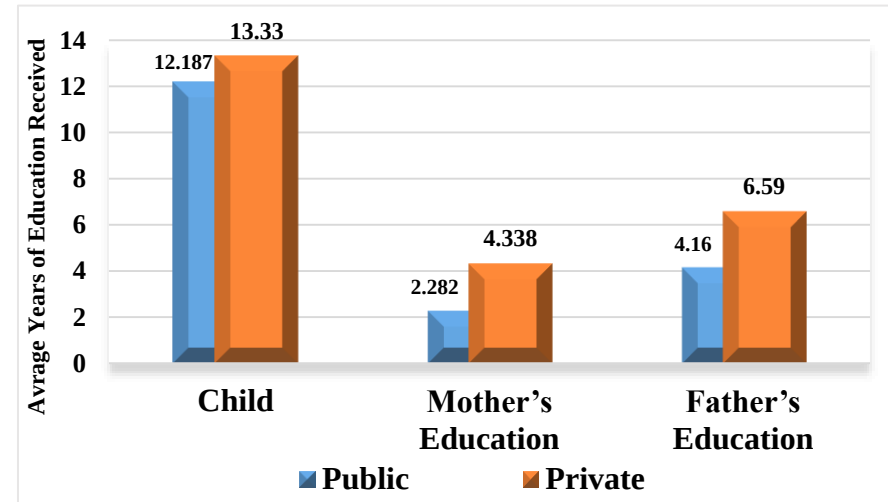


Figure 4.7: School-Wise Percentage of Students having Availability of Fellowship and Computer at Household

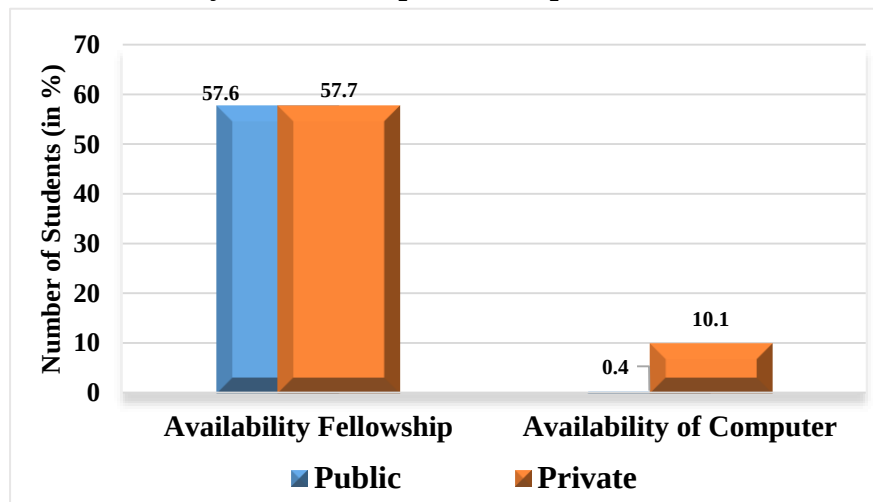
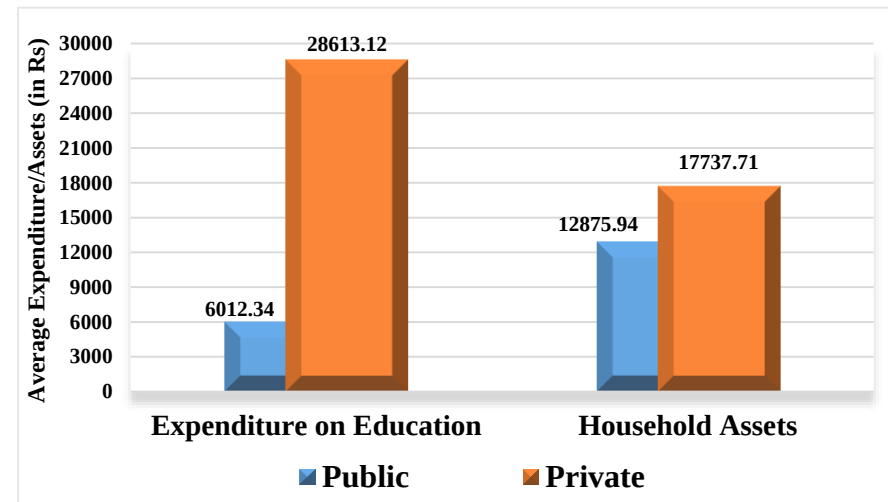


Figure 4.8: School-Wise Average Expenditure on Education and Value of Household Assets of a Student



Source: Calculated using YLS data for older cohort for India, 2013.

4.3 Factors Determining Educational Performance in Public Schools

The measures of central tendency (mean and median), the measure of dispersion (range and standard deviation) are included in descriptive statistics. It also includes skewness and kurtosis. Where, skewness measures the symmetry or in other words, lack of symmetry. A data set is called symmetric if it is equally distributed to the left and right side of the average value. At the same time, kurtosis measures if the data set is heavy-tailed or light-tailed relative to the normal distribution. If the data set has an outlier, it would be heavy-tailed; otherwise, it would be light-tailed in case of lack of outlier. In our analysis, variables such as Gender, SC, ST, OBC, Availability of Fellowship, and Availability of Computer are dummy variables.

The average children's test score in Mathematics and English is about 14 and 15, with a median value of around 14 and 16, respectively. The range for the Mathematics test score is 29 (29 – 0), with the standard deviation from the mean being about 7. Similarly, the English test score range is 18 (22 – 4), with a standard deviation of about 4 from the average value. Additionally, as per Table 4.1, the descriptive statistics for the children going in public school for the variable Gender show that the study has included both male and female students equally (Gender=0.504). Similarly, dummy variables SC, ST, and OBC reflect that about 18 percent, 10 percent, and 33 percent of the children in our data set belong to SC, ST, and OBC categories that are enrolled in public schools, respectively. On average, time spent on studying by a child enrolled in public school, apart from the time spent in school is approximately one hour, with a median value of zero. The range for the time spent on the study is 12 (12 – 0), with the standard deviation of about 2 from the average value. The BMI of the children, on average, is about 19, with a median value of about 19. The deviation of the BMI from the mean value is about 3. The children's years of education are about 12 years on average, with a median value of 12 years. The years of education received by the children is in 9 to 15 years range, with the standard deviation of about 2 years from the mean years of education. The availability of the fellowship for the students shows that almost 57 percent students are receiving fellowship.

Furthermore, the education received by the mother is approximately 2 years on average, and the median value is 0 years, while the father's educational level has the mean and median values of approximately 4 and 2 years, respectively. The range for both mother and father's education years is 14 years. The standard deviation from the mean years of education for mother and father is about 4 and 5 years, respectively. Interestingly, on average, children have achieved more than six times and thrice their mother and father's educational attainment, respectively.

Also, on average, education received by a mother's educational attainment is lower than the father's educational level.

The total amount spent on education by family in the last academic year is approximately ₹6,012 on average, with a median value of ₹3,212. The range for the total expenditure on education is ₹ 80,000, with a standard deviation of about ₹ 9,392. The family's household size is about 5 members on average, with a median value of 4 members. The range of the household size is 12 (13 – 1) members. The total of the five most valuable assets owned by the household is about ₹ 12,876, with a median value of ₹ 5,000. The deviation from the mean value is approximately ₹ 34,637. The availability of computer in the household for the students enrolled in public schools shows the plight of the situation. The result shows that less than 1 percent of students have availability of a computer.

Table 4.2: Descriptive Statistics for variables for the Children Studying in Public School

Variable	No. of Obs.	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
Mathematics Test Score	262	13.866	14	0	29	6.272	-0.035	2.325
English Test Score	262	15.321	16	4	22	3.560	-0.456	2.911
Gender	262	0.504	1	0	1	0.501	-0.015	1.0002
Time to Study	262	1.206	0	0	12	1.610	2.089	11.067
Body Mass Index	262	19.290	18.746	14.076	33.716	3.006	1.565	7.060
Year of Education	262	12.187	12	9	15	1.670	-0.0009	1.939
SC	262	0.176	0	0	1	0.381	1.705	3.909
ST	262	0.099	0	0	1	0.300	2.681	8.187
OBC	262	0.328	0	0	1	0.470	0.732	1.535
Availability Fellowship	262	0.576	1	0	1	0.495	-0.309	1.095
Mother's Education	262	2.282	0	0	14	3.549	1.416	3.824
Father's Education	262	4.160	2	0	14	4.597	0.675	2.011
Expenditure	262	6012.34	3212.5	0	80000	9392.215	4.064	24.446
Household Size	262	4.763	4	1	13	1.692	1.201	5.709
Assets	262	12875.94	5000	100	500000	34636.58	11.096	151.797
Availability of Computer	262	0.004	0	0	1	0.062	16.094	260.004

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.4 Determinants of Educational Performance for Public School Children

The study's objective is to examine the variables that influence the educational performance of the YL children in public and private school. Here, we have taken Mathematics and English test scores as a measure to gauge educational performance which is the dependent variable in the analysis. Educational performance is a function of child specific features, parental education, and household features which are our explanatory variable categories. The acquired Mathematics and English test scores for the whole sample size of the children enrolled in public schools have been regressed on independent variables and separately for male and female samples who are in public school. The Table 4.3 summarises the results procured after utilising a simple linear regression method.

Regression outcome exhibits that explanatory variables like gender, years of education, parental education, and expenditure on education significantly affect the educational performance (Mathematics and English test score) of the YL children enrolled in public schools for the whole sample size. Similar to the previous literature (Downey, 1994; Attavel and Battle, 2006; Teachman, 1987; Balatchander, 2013; Arteaga and Glewwe, 2014; Collins *et al.*, 2000; Hooda and Devi, 2017; Okyere, 2019; Saleh and Rahman, 2016; Chinyoka and Naidu, 2014; Nagi and Sridevi, 2020) where it is proven that gender influences educational performance. In our analyses, we found a difference in the educational performance of males and females where the results show that female educational performance is lower than male children. Results portray that *ceteris paribus*, the average Mathematics test score for male children, is greater by about 2.065 units than female children. On a similar line, we also found that keeping the influence of other factors constant, the average English test score for the female children is lower by 1.274 units compared to the male children.

Educational performance is influenced by years of education of the child. The partial regression coefficient of years of education shows that keeping the influence of other variables constant, on average, if the years of education increase by one unit, the Mathematics and English test score will increase by 1.295 and 0.801 units, respectively. There has been a significant impact of years of education on Mathematics and English test score for male and female children. With the increase in the years of education for male and female children, Mathematics performance will also increase with the coefficient of 1.313 units and 1.317 units, respectively. Similarly, In the case of sub sample, if the years of education increase by one year, the English test score, on average, would increase by 0.770 and 0.842 units for male and female children, respectively.

Therefore, both the Mathematics and English test scores of YL children are positively influenced by their years of education. This positive association of educational performance with the years of education is based on previous research done by Nagi and Sridevi (2020).

As it has been discussed in previous literature (Kohn, 1969; Majoribanks, 1979; Heyns, 1978; Arteaga and Glewwe, 2014; Black, 1985; Chiu *et al.*, 2016; Farooq *et al.*, 2011; Chinyoka and Naidu, 2014) that the child's educational performance is influenced by parental education. The regression coefficient for mother's education is statistically significant at 5 percent and 10 percent of significance level with the value of 0.278 and 0.374 for the whole sample size and male respectively for the Mathematics test score. This means a mother's educational status plays a significant role in determining YL children's mathematics performance, especially in the case of male children. The results display that on average, an increase in mother's education by one unit will lead to an increase in Mathematics test score by 0.278 units for whole and by 0.374 units for male children. Similarly, the father's education is influencing the English test score for the overall sample size. An increase in the father's education by one unit will increase English test scores, on average, by 0.098 units. The mother's education that is taken as a variable has a more significant impact on a male child's Mathematics performance where as it has no impact on the female child's.

Table 4.3: Regression Analysis for Mathematics and English Test Score of Children Studying in Public School

Variables	Mathematics Test Score						English Test Score					
	Whole Sample		Male		Female		Whole Sample		Male		Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	2.065	0.003***	0	-	0		1.274***	0.002	-	-	-	-
Time to Study	0.203	0.397	0.268	0.398	0.035	0.934	0.078	0.580	0.153	0.371	-0.202	0.435
Body Mass Index	0.066	0.549	0.161	0.362	0.003	0.986	0.043	0.506	0.016	0.869	0.085	0.368
Years of Education	1.295	0.000***	1.313	0.001***	1.317***	0.000	0.801***	0.000	0.770***	0.001	0.842***	0.000
SC	-1.075	0.278	-1.489	0.345	-1.015	0.485	-0.184	0.750	-0.386	0.649	-0.127	0.886
ST	-0.749	0.544	-0.864	0.631	-0.911	0.644	0.032	0.964	-0.145	0.881	-0.611	0.612
OBC	0.978	0.232	0.859	0.514	1.255	0.273	-0.237	0.619	-0.838	0.238	0.561	0.421
Availability of Fellowship	0.038	0.959	-0.016	0.989	0.346	0.739	-0.244	0.573	-0.128	0.835	-0.132	0.835
Mother's Education	0.278	0.026**	0.374	0.084*	0.201	0.209	0.104	0.155	0.097	0.402	0.118	0.229
Father's Education	-0.063	0.480	-0.137	0.331	-0.013	0.913	0.098*	0.060	0.097	0.204	0.090	0.233
Expenditure	0.0001	0.004***	0.00006	0.288	0.0002***	0.004	0.00003	0.146	4.80e-07	0.988	0.00006**	0.052
Household Size	-0.279	0.164	-0.272	0.347	-0.331	0.279	-0.130	0.269	-0.347**	0.027	0.119	0.523
Assets	-9.74e-06	0.319	-0.00001	0.235	0.00001	0.627	-6.73e-06	0.238	-1.85e-06	0.761	-0.00003*	0.078
Availability of Computer	4.116	0.436	0	-	3.770	0.486	3.035	0.326	0	-	3.051	0.355
Constant	-4.155	0.260	-3.576	0.545	-3.555	0.488	4.094	0.058	7.603	0.018	1.727	0.581
Number of obs.	262		132		130		262		132		130	
F	9.51(14, 247)		4.60(12, 119)		4.84(13,116)		7.96(14, 247)		4.60(12, 119)		4.28(13,116)	
Prob.>F	0.0000		0.0000		0.0000		0.0000		0.0000		0.000	
R-squared	0.3502		0.3167		0.3517		0.3110		0.3169		0.3239	
Root MSE	5.1973		5.3179		5.2353		3.0374		2.8661		3.1941	

Note: * $p < .1$, ** $p < .05$, *** $p < .01$

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

We also find that the expenditure on education significantly influences the educational performance of the YL child. The results show that the total schooling cost is positively associated with education performance for mathematics and English tests scores. This result is in line with previous literature (Lin and Lv, 2012; Azido, 2016; Kapur, 2018; Chinyoka and Naidu, 2014) where the same direction of influence is found. The partial regression coefficients of expenditure for Mathematics are 0.0001 and 0.0002 for whole sample size and female respectively. This means that keeping other variables constant, if the expenditure on education increases by one unit, the Mathematics score will increase by 0.0002 units for female children. Similarly, the partial regression coefficient of expenditure of English is 0.00006 for females. Keeping other things constant, if the expenditure on education increases by one unit, the English score will increase by 0.00006 units for female children. Therefore, the total expenditure on education variables has more positive influence on female children.

The regression results also indicate that household size plays a significant role in performance. Keeping other variables constant, the result shows that an increase in household size by one unit will decrease English test scores by 0.377 units for male children. We can conclude that household size is negatively related to the child's educational performance, especially for males. This result is different from the earlier research.

4.5 Tests for the Validity of Regression Analysis

To check the presence of multicollinearity in the model, VIF test has been used. Similarly to assess the presence of heteroscedasticity, BP test has been utilised.

4.5.1 Test for Multicollinearity

The presence of multicollinearity can be traced by VIF. When two or more explanatory variables have exact linear relationship between them then we have perfect multicollinearity if there is no collinearity between explanatory variables, the value of VIF will be one, however, if collinearity between explanatory variables increases, the value of VIF will also increase, and it can reach to infinity. Owing to the fact that the value of VIF for all the explanatory variables in Table 4.4 are less than five which makes the multicollinearity non-existent.

Table 4.4: Test for Multicollinearity of Children Studying in Public School

Variable	For Whole Sample		For Male		For Females	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Gender	1.12	0.891	-	-	-	-
Time to Study	1.44	0.694	1.48	0.677	1.62	0.616
Body Mass Index	1.05	0.957	1.19	0.841	1.06	0.940
Years of Education	1.66	0.602	1.78	0.563	1.67	0.600
SC	1.37	0.727	1.93	0.519	1.19	0.844
ST	1.32	0.759	1.69	0.592	1.18	0.847
OBC	1.42	0.703	1.90	0.525	1.21	0.825
Availability of Fellowship	1.30	0.770	1.36	0.737	1.28	0.782
Mother's Education	1.89	0.530	2.46	0.406	1.62	0.616
Father's Education	1.61	0.620	1.95	0.514	1.49	0.673
Expenditure	1.26	0.795	1.32	0.748	1.27	0.788
Household Size	1.11	0.904	1.21	0.824	1.12	0.891
Assets	1.10	0.909	1.18	0.848	1.09	0.914
Availability of Computer	1.03	0.973	-	-	1.05	0.950
Mean VIF	1.33		1.62		1.30	

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.5.2 Test for Heteroscedasticity

The results of the BP-test are presented in Table 4.5. After finding the F values of the model, which is more than 0.05. The null hypothesis of homoscedasticity is not rejected. This means that the model does not fit, or it can also be concluded that the residual square is unrelated to the explanatory variables. We infer that in our dataset, residuals are homoscedastic, and there is no heteroscedasticity in the model.

Table 4.5: Result of BP test for the presence of Heteroscedasticity for public school

Residual Squared	Mathematics Score						English Score					
	For Whole Sample		For Male		For Female		For Whole Sample		For Male		For Female	
	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values
Gender	1.724	0.677	-	-	-	-	-1.723	0.312	0		0	
Time to Study	-2.097	0.151	-1.488	0.480	-2.046	0.335	0.768	0.201	1.562	0.019	-0.492	0.694
Body Mass Index	-0.353	0.596	0.555	0.637	-0.723	0.349	-0.012	0.965	0.248	0.500	-0.244	0.592
Years of Education	2.294	0.129	0.674	0.801	3.685	0.030	-1.292	0.038	-0.085	0.919	-1.530	0.126
SC	-3.828	0.525	-11.608	0.269	1.881	0.795	-0.277	0.911	-0.588	0.857	-0.595	0.890
ST	-13.622	0.070	-19.340	0.108	-11.604	0.240	-4.079	0.186	-5.138	0.171	-4.091	0.483
OBC	-4.896	0.324	-8.002	0.361	-6.798	0.236	1.179	0.563	-0.744	0.785	3.498	0.301
Availability of Fellowship	-2.528	0.574	-1.352	0.858	-2.999	0.565	1.165	0.530	-1.328	0.573	1.030	0.738
Mother's Education	-1.079	0.155	-0.610	0.670	-1.451	0.071	0.079	0.799	-0.566	0.207	0.470	0.321
Father's Education	0.011	0.984	-0.910	0.332	0.449	0.469	-0.129	0.563	-0.262	0.370	0.237	0.518
Expenditure	0	0.785	0	0.696	0	0.719	0	0.738	0	0.869	0	0.417
Household Size	0.061	0.960	0.213	0.912	-0.0432	0.977	-0.443	0.376	0.361	0.546	-0.771	0.393
Assets	0	0.198	0	0.309	0	0.452	0	0.677	0	0.584	0	0.177
Availability of Computer	-25.633	0.425	0	-	-24.0488	0.374	-8.634	0.513	0	-	-8.445	0.597
Constant	14.659	0.512	23.256	0.554	4.290	0.867	26.573	0.004	4.207	0.732	34.912	0.023
Number of obs.	262		132		130		262		132		130	
F	0.85(14, 247)		0.61(12, 119)		1.03(13, 116)		0.79(14, 247)		1.07(12, 119)		1.00(13, 116)	
Prob.>F	0.6089		0.9163		0.4274		0.6812		0.3948		0.4587	
R-squared	0.0462		0.0472		0.1035		0.0428		0.0971		0.1005	
Adj. R-squared	-0.0078		-0.0488		0.0031		-0.0115		0.0060		-0.0003	
Root MSE	31.55		35.383		26.191		12.982		11.04		15.48	

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.6 A Non-Parametric Approach: Assessment of Gender-Based Differences for Public School

This segment of the chapter analyse gender based mean difference by using a non-parametric approach. A t-test is used to analyse the gender based mean difference for all variables individually.

Table 4.6: Gender-Based Means of the Variables for Public School

Public School				
Variables	Overall	Male	Female	Difference
Mathematics Test Score	13.866 (6.272)	15.152 (6.131)	12.562 (6.166)	2.590***
English Test Score	15.321 (3.560)	16.008 (3.305)	14.623 (3.684)	1.384***
Time to study	1.206 (1.610)	1.379 (1.789)	1.031 (1.392)	0.348**
Body Mass Index	19.290 (3.006)	18.912 (2.875)	19.674 (3.097)	-0.762**
Years of Education	12.187 (1.670)	12.394 (1.772)	11.977 (1.660)	0.417**
SC	0.176 (0.381)	0.212 (0.410)	0.1138 (0.347)	0.074*
ST	0.099 (0.300)	0.129 (0.336)	0.069 (0.255)	0.060*
OBC	0.328 (0.470)	0.386 (0.489)	0.269 (0.445)	0.117**
Availability of Fellowship	0.576 (0.495)	0.652 (0.478)	0.5 (0.502)	0.152***
Mother's Education	2.282 (3.549)	1.962 (3.396)	2.608 (3.682)	-0.646*
Father's Education	4.160 (4.597)	3.765 (4.621)	4.562 (4.555)	-0.796**
Expenditure	6012.34 (9392.215)	6811.833 (9442.294)	5200.546 (9307.069)	1611.287*
Household Size	4.763 (1.692)	4.833 (1.778)	4.692 (1.604)	0.141
Assets	12875.94 (34636.58)	13464.73 (44721.66)	12278.08 (19888.07)	1186.658
Availability of Computer	0.004 (0.062)	0 (0)	0.008 (0.088)	-0.008

Note: *p<.1, **p<.05, ***p<.01 and Standard deviations are in parentheses.

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

As we have observed gender-based differences in Mathematics and English test scores (educational performance), of the children enrolled in public school, in the study. We further categorise our sample into two groups i.e. male and female. In the following Table 4.6, the mean of each explanatory variable for the whole sample of public school followed by male and female, and the difference between the groups is being shown. The Table 4.6 indicates that the average value of the majority of the variables have significant differences based on gender. However, a few variables are not significantly different from zero. The Mathematics test score has a significant difference based on gender, and it exhibits that the average test score for female children is less than the average test score of male children in public school by 2.590, and the difference is statistically vital. The English test score has a significant difference based on gender and it exhibits that the average test score for female children is less than the average test score of male children in public school by 1.348 unit, and the difference is statistically vital. In other words, the average Mathematics test scores for female children are less than the average test scores of male children by almost 17 percent. The average English test scores have a significant difference and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 8.6 percent.

The time to study is also statistically significant and results show that male children spend on an average 0.348 hours more time on study compared to female. There is a visible gender-based significant difference in the average BMI, female has higher average BMI compare to male child by 0.762. In other words, the average BMI for female children is higher than the average BMI of male children by 4 percent. The same gender-based significant differences are visible in Table 4.6 for the average year of education, and the results indicate that female children have lesser average years of education than male children. The difference between the proportion of SCs and STs among males and females is significant, which is 7.4 and 6 percent. Similarly, the difference between the proportion of OBCs among males and females is significant, 11.7 percent. The variable, availability of fellowship, is different and statistically significant, and almost 15 percent more male children have availability of fellowship compared to female children. Apart from these, the average years of education of mother and father for female children are higher than male children by 0.646 and 0.796 respectively. The average expenditure on education has a significant difference, and it shows that the average expenditure on education for female children are less than the average expenditure on education for male children by almost 23.65 percent. We see that the average values of the background variables are better for male children. In the following section, we attempt to find whether these differences influence the average test score between males and females.

4.7 Gender-Wise Statistical Description for Public School

Tables 4.7 and 4.8 show the descriptive statistics of the male and female children studying in public schools. Tables indicate that the average mathematics and English test score for male children is greater than the average test score scored by female children in both subjects. On the same line, on average, more male children are having fellowship than female children. Similarly, the amount spent on education in a year is more for male children than for female children. Additionally, the household assets are more for male children than female children.

As shown in Figure 4.9, the average marks scored by male public school students in mathematics and English is higher than the female students enrolled in public schools. In other words, on average, male students enrolled in public school score about 15 marks in Mathematics and 16 marks in English, whereas female students enrolled in public school score 12.5 and 14.6 marks in Mathematics and English, respectively.

It shows the gender-wise percentage of the public school students having the availability of the fellowship. Figure 4.10 indicates enrollment in public school based on ethnicity (social background) - it shows that the participation of SC, ST, and OBC male students in public school is 21, 13, and 39 percent, respectively, which is more than the participation of the female students in public school.

The availability of the fellowship is indicated in Figure 4.11. It indicates only half of the female students have availability of fellowship in public school, whereas 65 percent of male students are getting. Previous studies have established that expenditure on education and value of household assets (wealth) plays a significant role in the educational performance of the children.

This section displays gender-wise average expenditure on education and value of five most expensive assets in the household. Figure 4.12 indicates that the average expenditure on education of female students enrolled in public school is lower than their counterparts. Similarly, the value of the household assets is more for the male students than the female students.

Table 4.7: Descriptive Statistics for Male Students for Public School

Variable	N	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
Mathematics Test Score	132	15.152	15	0	29	6.131	-0.159	2.367
English Test Score	132	16.008	16	8	22	3.305	-0.228	2.266
Time to Study	132	1.379	1	0	12	1.789	2.433	12.644
Body Mass Index	132	18.912	18.416	14.076	31.992	2.875	1.810	8.351
Year of Education	132	12.394	12	9	15	1.542	-0.113	2.079
SC	132	0.212	0	0	1	0.410	1.408	2.984
ST	132	0.129	0	0	1	0.336	2.216	5.913
OBC	132	0.386	0	0	1	0.489	0.467	1.218
Availability Fellowship	132	0.652	1	0	1	0.478	-.636	1.404
Mother's Education	132	1.962	0	0	14	3.396	1.719	4.880
Father's Education	132	3.765	1	0	14	4.621	0.850	2.261
Expenditure	132	6811.833	3750	0	60000	9442.294	3.022	13.922
Household Size	132	4.833	4	1	11	1.778	0.825	3.697
Assets	132	13464.73	5000	500	500000	44721.66	9.908	107.801
Availability of Computer	132	0	0	0	0	0	.	.

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Table 4.8: Descriptive Statistics for Female Students for Public School

Variable	N	Mean	Median	Minimum	Maximum	Std. Dev.	Skewness	Kurtosis
Mathematics Test Score	130	12.562	13	0	28	6.166	0.091	2.379
English Test Score	130	14.623	15	4	22	3.684	-0.556	2.975
Time to Study	130	1.031	0	0	5	1.392	1.071	2.946
Body Mass Index	130	19.674	19.274	14.405	33.716	3.097	1.378	6.288
Year of Education	130	11.977	12	9	15	1.772	0.161	1.860
SC	130	0.138	0	0	1	0.347	2.094	5.383
ST	130	0.069	0	0	1	0.255	3.394	12.519
OBC	130	0.269	0	0	1	0.445	1.041	2.083
Availability Fellowship	130	0.5	.5	0	1	0.502	0	1
Mother's Education	130	2.608	0	0	14	3.682	1.160	3.095
Father's Education	130	4.562	3	0	14	4.555	0.511	1.843
Expenditure	130	5200.546	2975	0	80000	9307.069	5.253	37.158
Household Size	130	4.692	4.5	2	13	1.604	1.687	8.771
Assets	130	12278.08	5000	100	150000	19888.07	4.050	23.973
Availability of Computer	130	0.008	0	0	1	0.088	11.270	128.008

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Figure 4.9: Subject-Wise Average Marks Scored by Students of Public School

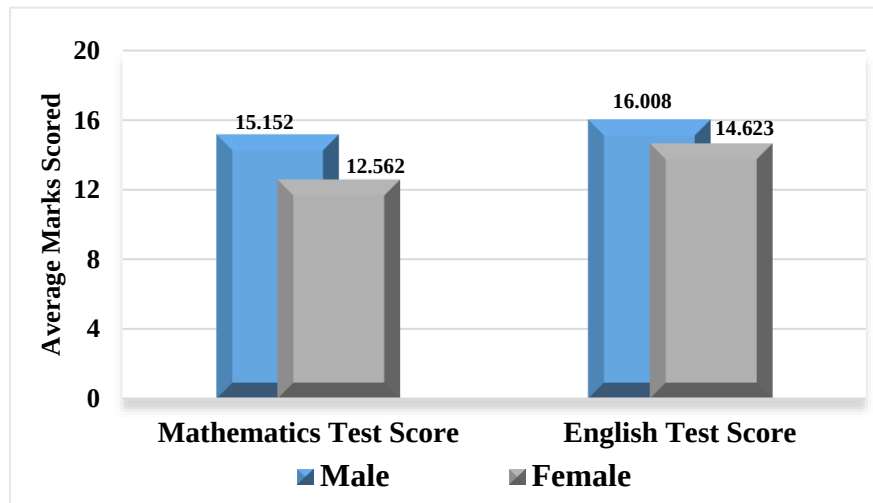


Figure 4.10: Gender-Wise Percentage of Public School Students from Different Social Groups

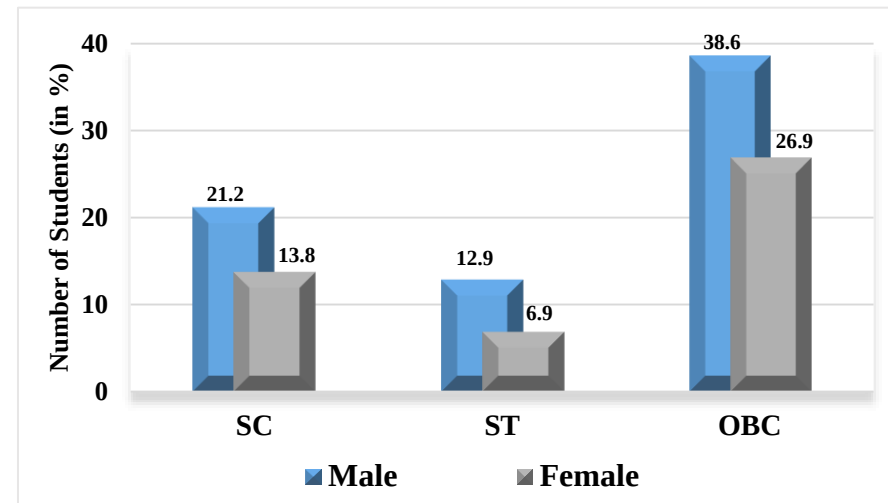


Figure 4.11: Gender-Wise Percentage of Public School Students having Availability of Fellowship

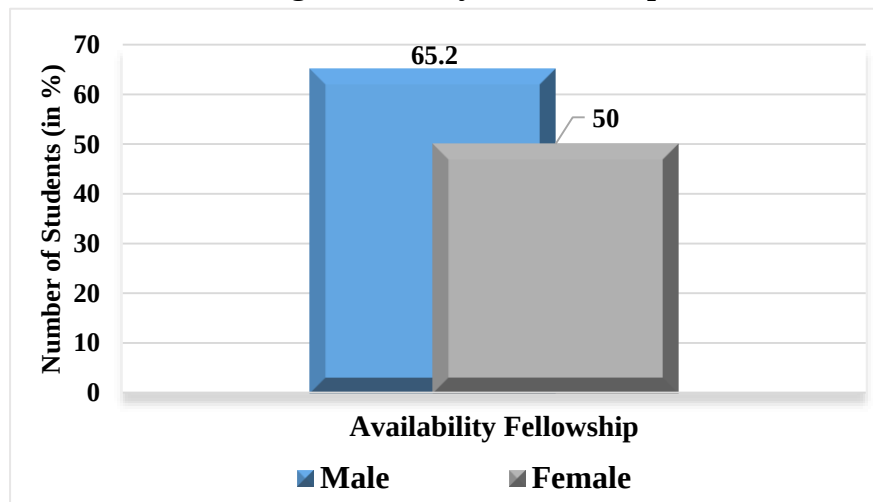
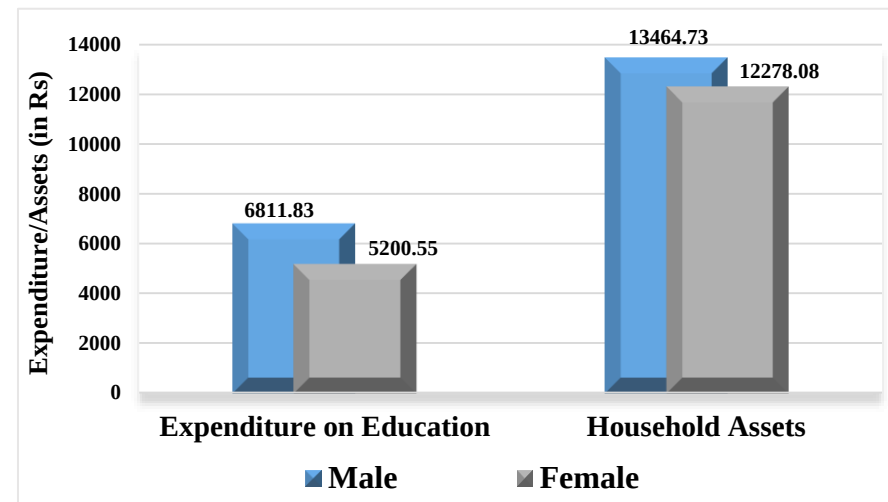


Figure 4.12: Gender-Wise Average Expenditure on Education and Value of Household Assets of Public School Students



Source: Calculated using YLS data for older cohort for India, 2013.

4.8 Factors Causing Gender Gap in Performance of Public School Children

It is evident from earlier calculation; the dummy variable gender significantly affects children's educational performance enrolled in public school. There are two subsets of samples in the study, which are the male enrolled in public school (M_{Pub}) and female enrolled in public school (F_{Pub}), also there is an outcome variable i.e. performance (P) and a set of predictor(explanatory variables). The difference between expected/average values of these subsets can be determined with the help of the following equation,

$$R_{Pub} = E(P_{M_{Pub}}) - E(P_{F_{Pub}})$$

Where,

$E(P_{M_{Pub}})$ indicates the average value of the performance (outcome variable) for male enrolled in public school, which is accounted for by group difference in the predictor. $E(P_{F_{Pub}})$ Presents the average values of the outcome variable (performance) for females enrolled in public school, which is accounted for by group difference in the predictor.

On the basis of linear model

$$Y_i = X_i B_i + \varepsilon_i, \quad E(\varepsilon_i) = 0, \quad i \in (M_{Pub}, F_{Pub})$$

Where X represents a vector containing independent variables and a constant, ε stands for an error, the expected performance gap can be written as the difference in the linear prediction at the group-specific mean of the regression that is:

$$\begin{aligned} R_{Pub} &= E(P_{M_{Pub}}) - E(P_{F_{Pub}}) \\ &= E(P_{M_{Pub}})' \beta_{M_{Pub}} - E(P_{F_{Pub}})' \beta_{F_{Pub}} \quad \dots (4.1) \end{aligned}$$

$$\because E(P_i) = E(X_i' \beta_i + \varepsilon_i)$$

$$= E(X_i \beta_i) + E(\varepsilon_i) = E(X_i)' \beta_i$$

Where $E(\beta_i) = \beta_i$ and $E(\varepsilon_i) = 0$ by assumption.

To assess the contribution of group difference in predictors to the overall outcomes difference, (4.1) can be rearranged as follows: Blinder (1973), Oaxaca (1973), and Jann (2008).

$$R = \{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}' \beta_{M_{Pub}} + E(P_{M_{Pub}})' (\beta_{M_{Pub}} - \beta_{F_{Pub}}) + \{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}' (\beta_{M_{Pub}} - \beta_{F_{Pub}}) \quad \dots (4.2)$$

The above equation is a “Threefold” decomposition, and the outcome difference is categorised into three components,

$$R_{Pub} = E + C + I$$

The first component,

$$E = \{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}' \beta_{M_{Pub}}$$

Amount to the part of the differential that is due to group differences in the predictors (the “*endowment effect*”). It measures the test score gap due to the difference in the background characteristics of male and female child, which apply to female children's impact .

The second component,

$$C = E(P_{M_{Pub}})' (\beta_{M_{Pub}} - \beta_{F_{Pub}})$$

Measures the contribution of differences in the coefficient (including differences in the intercept). In our analysis ‘C’, indicates how much of the test score gap is due to the difference in the variation of mean outcome of male and female children, applied to the impact of female children.

And the third component,

$$I = \{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}' (\beta_{M_{Pub}} - \beta_{F_{Pub}})$$

is an intercept term accounting for the fact that differences in endowments and coefficient exist simultaneously between the two groups.

The third term, $\{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}' (\beta_{M_{Pub}} - \beta_{F_{Pub}})$ measures the contribution to the test score gap of difference between male and female students in the impact of background characteristics on learning, applied to the difference in the average characteristics of male and female students $\{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}$.

The decomposition equation (4.2) is derived from the perspective of Group F. The coefficients of Group F lade the group difference in the predictors to analyse the endowments effect (E). The E calculates the expected variation in Group F's mean outcome if Group F had Group M's predictor levels. Correspondingly, for the C, the dissimilarities in coefficients are laden by

Group F's predictor levels. That is, the C component tests the expected variation in Group F's mean outcome if Group F had Group M's coefficients.

The Blinder-Oaxaca decomposition (equation 4.2) is shown in Table 4.9. The Mathematics test score difference between male and female children is 0.413 standard deviations. We see that this difference, total 0.413 standard deviation, is primarily and only because of the coefficient effect (significant at 1 percent level of significance). The contribution of this effect is 85.96 percent of the total difference or 0.355 standard deviation out of 0.413. Similarly, the English test score difference between male and female children is 0.389 standard deviation. The coefficient effect is significant at 1 percent of level of significance. The difference, total 0.389 standard deviation, is mainly because of the coefficient effect. The coefficient effect contributes almost 98.71 percent of the total difference.

The decomposition result reports the mean predictions by groups and their difference in the first section. In our analysis, the mean Mathematics test score is 2.417 for male and 2.003 for female children, yielding a performance gap of 0.413 for Mathematics. Similarly, the mean English test score is 4.497 for male and 4.196 for female children, yielding a performance gap of 0.389.

In the second panel of the decomposition results, the performance gap is divided into three parts. The first part would reflect the mean increase in the female children's performance if they had the same characteristics as male children. The second term quantifies the change in female children's performance when applying the male's coefficient to the female's characteristics. The third part is the intersection term that measures the simultaneous effects of difference in endowment and coefficient effect. Even though we have found that the average values of the variables are significantly different (Table 4.6) and better for male children, this difference does not explain or contribute to the difference in the average scores between them. It explains the difference in the average impact or returns to the average values of those background characteristics. In other words, the difference in the extent of pressure put upon the test score explains 85.96 percent (2.224 out of the total difference of 2.590) of the mean performance difference between males and females.

The endowment effect (i.e. the difference between the two groups in the mean values of the child) has almost no effect (0.114 standard deviation: not statistically different from zero).

The English test score difference between male and female children is 0.389 standard deviations. We see that this difference, a total 0.389 standard deviation, is primarily because of

the coefficient effect. The contribution of the coefficient effect is 98.71 percent of the total difference or 0.384 standard deviation out of 0.389 standard deviations. Moreover, the coefficient effect reflects that the differential returns to the background characteristics explain 98.71 percent of the total difference. It explains the difference in the average impact or returns to the average values of the background characteristics. In other words, the difference in the extent of pressure put upon the test score explains 98.71 percent of the mean performance difference between males and females. Our results explain the difference in average test scores between males and females.

Table 4.9: Blinder-Oaxaca Decomposition Results for Public Schools for the Mathematics and English test Score

	Mathematics Test Score			English Test Score		
	Raw Test score	Standardised Test Score	P value	Raw Test score	Standardised Test Score	P value
	Coefficient	Coefficient		Coefficient	Coefficient	
Male	15.152	2.417	0.000	16.008	4.497	0.000
Female	12.562	2.003	0.000	14.623	4.108	0.000
Difference	2.590	0.413	0.001***	1.384	0.389	0.002***
Endowment Effect $\{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}'\beta_{M_{Pub}}$	0.715	0.114	0.205	0.139	0.039	0.668
Coefficient Effect $E(P_{M_{Pub}})'(\beta_{M_{Pub}} - \beta_{F_{Pub}})$	2.224	0.355	0.003***	1.367	0.384	0.002***
Interaction Effect $\{E(P_{M_{Pub}}) - E(P_{F_{Pub}})\}'(\beta_{M_{Pub}} - \beta_{F_{Pub}})$	-0.350	-0.056	0.498	-0.121	-0.034	0.714

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.9 Factors Contributing to the Gender-Gap in Educational Performance for Public School Children

Table 4.10 shows the results of the detailed Blinder-Oaxaca decomposition. We have discussed before that the endowment and interaction effects are not statistically significant for Mathematics test score in our results. However, the coefficient effect is significant at 1 percent level of significance. The results do not explain what factors contribute to the coefficient effect.

The second panel of the Table 4.10 presents the outcome of the detailed Blinder-Oaxaca decomposition for the English test score. We have discussed that the coefficient effects are statistically significant in our results. However, the coefficient is significant at 1 percent levels of significance. In coefficient effect, the variable household size is significant at 5 percent level of significance. The household size negatively explains the entirety of the coefficient effect. We find it is just the household size at the time of the survey, which plays a crucial role in explaining the difference in the average English test score based on gender. We find household size contribute 159.89 percent of the total coefficient effect. In other words, out of the total difference of 0.384, household size contribute 0.614 to coefficient effect. We also learn that there are differential returns to the same average household size based on gender, which is greater for male children than females. Most of the previous literature has neither discussed nor included the household size variable this inclusion in our analysis shows a particularly important role in the English performance of a child.

Table 4.10: Detailed Blinder-Oaxaca Decomposition for Mathematics and English Test Score for the Public School Students

	Mathematics Test Score						English Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect		Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to Study	0.002	0.933	0.038	0.660	0.013	0.669	-0.020	0.474	0.103	0.255	0.035	0.336
Body Mass Index	-0.0003	0.986	0.497	0.498	-0.019	0.519	-0.018	0.408	-0.381	0.606	0.015	0.617
Years of Education	0.088	0.071	-0.007	0.994	-0.0003	0.994	0.099	0.069	-0.243	0.809	-0.008	0.810
SC	-0.012	0.522	-0.010	0.825	-0.006	0.826	-0.003	0.886	-0.010	0.832	-0.005	0.833
ST	-0.009	0.656	0.0005	0.986	0.0005	0.986	-0.010	0.627	0.009	0.764	0.008	0.767
OBC	0.023	0.333	-0.017	0.820	-0.007	0.821	0.018	0.453	-0.106	0.167	-0.046	0.247
Availability of Fellowship	0.008	0.741	-0.029	0.813	-0.009	0.814	-0.006	0.835	0.0007	0.996	0.0001	0.996
Mother's Education	-0.021	0.338	0.072	0.520	-0.018	0.554	-0.021	0.350	-0.015	0.893	0.004	0.894
Father's Education	0.002	0.913	-0.090	0.510	0.016	0.550	-0.020	0.362	0.008	0.953	-0.001	0.953
Expenditure	0.042	0.208	-0.087	0.199	-0.027	0.340	0.030	0.257	-0.097	0.158	-0.030	0.316
Household Size	-0.007	0.567	0.044	0.887	0.001	0.890	0.005	0.642	-0.614	0.055*	-0.018	0.525
Assets	0.002	0.809	-0.049	0.349	-0.005	0.790	-0.009	0.783	0.084	0.135	0.008	0.784
Availability of computer	-0.005	0.567	-0.005	0.567	0.005	0.567	-0.007	0.496	-0.007	0.496	0.007	0.496
Total	0.114	0.205	0.355	0.003***	-0.056	0.498	0.039	0.668	0.384	0.002***	-0.034	0.714

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Note: *p<.1, **p<.05, ***p<.01

4.10 Factors Determining Educational Performance in Private Schools

Table 4.11 shows the descriptive statistics for the children enrolled in private school. On average, the children's test score in Mathematics and English is about 18 and 17, with a median value of around 19 and 18, respectively. The range for the Mathematics test score is 28 (29 – 1), with the standard deviation from the mean is about 6. Similarly, the English test score range is 15 (22 – 7), with a standard deviation of about 3 from the average value. Additionally, as per Table 4.1, the descriptive statistics for the children enrolled in private schools for the variable Gender show that the study has included 55 percent of male students and 45 percent of female student (Gender=0.504). In other words, study has included 212 male sample and 173 female students.

Similarly, dummy variables SC, ST, and OBC reflect that about 11 percent, 6 percent, and 45 percent of the children in our data set belong to SC, ST, and OBC categories who are enrolled in private schools, respectively. On an average, time spent on study by a child, enrolled in private school, apart from the time spent in school is approximately 2 hour per day, with a median value of two. The range for the time spent on study is 9 (9 – 0) hours, with the standard deviation of about 2 from the average value. The BMI of the children, on an average, is about 20, with a median value of about 19. The deviation of the BMI from the mean value is about 3. On average, the years of education of children is about 13 years with a median value of 14 years. The years of education received by the children is in 10 to 16 years range, with the standard deviation of about 1 years from the mean years of education. The availability of the fellowship for the students shows that almost 57.7 percent private school students are receiving a fellowship.

Furthermore, the mother's highest education level is approximately 4 years on average, and the median value is 5 years, while the father's highest education has the mean and median values of approximately 7 years. The range for both mother and father's education years is 14 years. The standard deviation from the mean years of education for mother and father is about 4 and 5 years, respectively. Interestingly, on average, children have achieved more than thrice and twice their mother and father's educational attainment, respectively. Also, the average education received by the mother's educational attainment is lower than the father's educational level. It reflects that the parents of the students enrolled in private school are more educated than of the students enrolled in public schools.

The total amount spent on education by family in the last academic year is approximately ₹ 28,613 on average, with a median value of ₹ 15,000. The range for the total expenditure on education is ₹ 4,42,200, with a standard deviation of about ₹ 37,255. The family's household size is about 5 members on average, with a median value of 4 members. The range of the household size is 25 (26 – 1) members. The total of the five most valuable assets owned by the household is about ₹ 17,738, with a median value of ₹ 7,000. The deviation from the mean value is approximately ₹ 29,136. The availability of computer in the household for the students enrolled in public schools shows the plight of the situation as result shows that only 10 percent students are having access to computer.

Table 4.11: Descriptive Statistics for the children studying in Private school

Variable	N	Mean	Median	Min	Max	Std. Dev.	Skewness	kurtosis
Mathematics Test Score	385	17.805	19	1	29	5.737	-0.554	2.831
English Test Score	385	17.262	18	7	22	2.992	-0.589	2.939
Gender	385	0.551	1	0	1	0.498	-0.204	1.041
Time to Study	385	1.995	2	0	9	1.566	0.790	4.220
Body Mass Index	385	19.657	18.953	13.119	35.145	3.161	1.371	5.846
Year of Education	385	13.330	14	10	16	1.108	-0.459	2.707
SC	385	0.114	0	0	1	0.319	2.425	6.879
ST	385	0.057	0	0	1	0.232	3.816	15.561
OBC	385	0.452	0	0	1	0.498	0.193	1.037
Availability Fellowship	385	0.577	1	0	1	0.495	-0.310	1.096
Mother's Education	385	4.338	5	0	14	4.486	0.542	2.028
Father's Education	385	6.590	7	0	14	4.973	-0.075	1.635
Expenditure	385	28613.12	15000	0	442200	37255.46	4.735	43.680
Household Size	385	4.626	4	1	26	1.920	4.445	43.706
Assets	385	17737.71	7000	300	400000	29135.54	7.174	82.977
Availability of Computer	385	0.101	0	0	1	0.302	2.643	7.985

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Table 4.12: Regression Analysis for Mathematics and English Test Score of Children Studying in Private School

Variables	Mathematics Test Score						English Test Score					
	For Whole Sample		For Male		For Female		For Whole Sample		For Male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	2.281	0.000***	0	-	0	-	0.379	0.177	0	-	0	-
Time to Study	0.921	0.000***	0.858	0.000***	1.004	0.000***	0.277	0.003***	0.249	0.052*	0.278	0.058**
Body Mass Index	-0.012	0.882	0.060	0.612	-0.117	0.337	0.005	0.917	0.045	0.476	-0.037	0.610
Years of Education	1.019	0.000***	1.466	0.000***	0.405	0.341	0.431	0.001***	0.537	0.003***	0.276	0.259
SC	-1.266	0.165	-1.196	0.344	-2.173	0.103	-0.753	0.121	-0.412	0.541	-1.236	0.082*
ST	-3.300	0.004***	-2.923	0.092*	-3.940	0.014**	-0.157	0.796	0.480	0.603	-0.671	0.269
OBC	0.007	0.990	0.006	0.994	-0.211	0.815	-0.160	0.610	-0.054	0.901	-0.268	0.588
Availability of Fellowship	-0.212	0.704	-0.545	0.462	0.106	0.907	-0.269	0.364	-0.172	0.663	-0.490	0.316
Mother's Education	0.031	0.672	-0.089	0.363	0.178	0.160	0.059	0.135	0.028	0.588	0.131	0.087*
Father's Education	0.079	0.225	0.059	0.463	0.116	0.326	0.075	0.030**	0.097	0.026**	0.028	0.665
Expenditure	0.00003	0.000***	0.00003	0.002***	0.00002	0.009***	0.00002	0.000***	0.00003	0.000***	0.00001	0.043**
Household size	0.016	0.908	-0.023	0.878	0.115	0.697	0.008	0.913	0.022	0.785	0.026	0.871
Assets	-0.00001	0.293	-9.70e-06	0.373	-7.75e-06	0.782	-5.15e-06	0.330	-6.81e-06	0.242	-6.17e-06	0.599
Availability of Computer	1.751	0.063*	1.749	0.194	1.196	0.321	0.899	0.073*	1.232	0.087*	0.370	0.534
Constant	0.308	0.932	-3.945	0.396	9.187	0.133	9.694	0.000	7.430	0.003	13.001	0.000
Number of obs.	385		212		173		385		212		173	
F	11.19(14, 370)		6.88(13, 198)		4.96(13, 159)		9.73(14, 370)		7.34(13, 198)		4.88(13, 159)	
Prob.>F	0.000		0.0000		0.000		0.000		0.0000		0.000	
R-squared	0.2974		0.3112		0.2886		0.2691		0.3252		0.2421	
Root MSE	4.8993		4.7579		5.1001		2.6062		2.5411		2.7121	

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.11 Determinants of Educational Performance for Private School Children

The study's objectives are to examine the variables that influence educational performance for children enrolled in private schools. The Table 4.12 summarises the results procured after utilising a simple linear regression method.

Regression outcomes exhibit that explanatory variables like gender, Time to study, years of education, social background, and expenditure on education significantly affect the educational performance(Mathematics and English test score) of the YL children enrolled in private schools for the whole sample size. According to reviewed literature, (Downey, 1994; Attavel and Battle, 2006; Teachman,1987; Balatchander, 2013; Arteaga and Glewwe, 2014; Collins *et al.*, 2000; Hooda and Devi, 2017; Okyere, 2019; Saleh and Rahman, 2016; Chinyoka and Naidu, 2014; Nagi and Sridevi, 2020) where it is proven that gender influences educational performance. On the same line, in our results, it is visible that educational performance for a female child is lower than that of a male child. Variable Gender is significant at 1 percent of the level of significance. It can be interpreted that *ceteris paribus*, the average Mathematics test score showcases that the male children are better by about 2.281 units compared to female children. Contrary to this, our results do not find gender as significant variable for the English test score. Therefore, there is no gender-based gap in performance for English subject for the students studying in private school.

The regression results indicate that time spent on study apart from the schooling hours influences the educational performance received by the YL children. The partial regression coefficient of time spent on study is 0.921 and 0.277, for the whole sample and it means that keeping the influence of other variables constant, on average, if the time spent on study increases by one unit, the Mathematics and English test score will increase by 0.921 and 0.277 units, respectively. There has been a significant impact of time spent studying mathematics and English test scores for male children and female children. With the increase of one unit in the time spent on study for male and female children, educational performance would increase with the coefficient of 0.858 units and 1.004 units respectively for Mathematics. Similarly, for English test score, with the increase of one unit in the time spent on study for male and female children, educational performance would increase with the coefficient of 0.858 units and 1.004 units respectively. Therefore, children's educational performance (Mathematics and English) is positively associated with the time spent on study apart from in school though a few studies

(Nagi and Sridevi, 2020) found this association between time to study and educational performance.

The years of education influences the educational performance of the. The partial regression coefficient for the years of education shows that keeping the influence of other variables constant, on average, if the years of education increase by one unit, the Mathematics and English test score will increase by 1.019 and 0.431 units, respectively. There has been a significant impact of years of education on Mathematics, and English test score for the male children enrolled in private school. With an increase in the years of education for male children, Mathematics and English performance will increase by 1.466 and 0.537 units, respectively. Hence, the children's Educational Performance (Mathematics and English) is positively associated with the years of education. This result is in line with the study conducted by Nagi and Sridevi (2020).

There are literature available that show the impact of social background on the child's educational performance (Considine and Zappala, 2002; Attavel and Battle, 2006). Contrary to previous research, the social background plays almost insignificant role in determining educational performance. Only ST category is significant at the level of 1 percent for the children enrolled in Private school for Mathematics Performance. The results can be interpreted as follows - The average Mathematics test score for the children belonging to the SC category is lower by 3.300 units than other category children for the whole sample. Similarly, the average Mathematics test score for ST category child enrolled in private school is lower by 2.923 units, and 3.940 units, for male and female children, respectively, compared to other categories, keeping other factors constant. Similarly, Female children belonging to the SC category are performing lower in the English test than the other category children. Here, it is visible that women belonging to SC and ST category perform lower than the other category children as well as males of their category.

As it has been discussed in previous literature, (Kohn, 1969; Majoribanks, 1979; Heyns, 1978; Arteaga and Glewwe, 2014; Black, 1985; Chiu *et al.*, 2016; Farooq *et al.*, 2011; Chinyoka and Naidu, 2014) that the child's educational performance is influenced by parental education. The regression coefficient for father's education is statistically significant at 5 percent and 10 percent of the significance level with the value of 0.075 and 0.097 for the whole sample size and male respectively for the English test score. This means a father's educational status plays a vital role in determining the children's English performance, especially more so in the case

of male children. The results display that, on average, an increase in father's education by one unit will lead to an increase in English test scores by 0.075 units for whole and by 0.097 units for male children. Similarly, the mother's education influences the English test score for female children enrolled in private school. An increase in the mother's education by one unit will increase English test scores, on average, by 0.131 units. Contrary to this, our results show that parental education is insignificant in determining Mathematical performance for the students studying in private school.

We also find that the expenditure on education significantly influences the educational performance of the YL children. The results show that the total schooling cost is positively associated with education performance for mathematics and English tests scores. This result is in line with previous literature (Lin and Lv, 2012; Azido, 2016; Kapur, 2018; Chinyoka and Naidu, 2014) where the same direction of influence is found. The partial regression coefficients of expenditure for Mathematics show that keeping other variables constant, if the expenditure on education increases by one unit, the Mathematics score will increase by 0.00003 unit overall and for male children. It also shows the same association with female child performance. The regression coefficient for the overall male and female children is positive, and it shows that an increase in the expenditure on education will lead to an increase in educational performance.

The above regression results also depict that the availability of computer in the house is also a significant variable in determining Mathematics and English performance of the children enrolled in private school. The partial regression coefficient for the availability of the computer at household is 1.751 and 0.899 for Mathematics and English test score for whole sample size, respectively. It means child with the availability of computer perform better by 1.751 and 0.899 unit in Mathematics and English compared to the child who does not have availability of the computer at house. This relationship of the availability of the computer with the educational performance is in line with previous literature (Attavel and Battle, 2006).

4.12 Tests for the Validity of Regression Analysis for the Private School

This section of the chapter check the validity of the regression model. To check the presence of multicollinearity in the model, VIF test has been used. Similarly, to assess the presence of heteroscedasticity, BP test has been utilised.

4.12.1 Test for Multicollinearity

As we know, if collinearity between explanatory variables increases, the value of VIF will also increase, and it can reach to infinity. Table 4.13 depicts that the value of VIF for the whole sample size is 1.29 and for males and females is 1.34 and 1.36, respectively. Since the value of VIF for all the explanatory variables is less than five, which makes the multicollinearity non-existent.

Table 4.13: Test for Multicollinearity of Children Studying in Private School

Variable	Whole Sample		Male		Female	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Gender	1.10	0.909	-	-	-	-
Time to Study	1.21	0.828	1.18	0.844	1.25	0.803
Body Mass Index	1.07	0.934	1.10	0.910	1.12	0.896
Years of Education	1.23	0.810	1.27	0.790	1.32	0.759
SC	1.34	0.744	1.50	0.668	1.37	0.728
ST	1.13	0.883	1.13	0.882	1.17	0.851
OBC	1.37	0.729	1.54	0.651	1.22	0.820
Availability of Fellowship	1.21	0.824	1.24	0.806	1.21	0.829
Mother's Education	1.77	0.566	1.67	0.600	1.01	0.499
Father's Education	1.67	0.599	1.59	0.627	1.81	0.553
Expenditure	1.24	0.805	1.37	0.732	1.21	0.827
Household Size	1.08	0.926	1.09	0.915	1.16	0.862
Assets	1.34	0.748	1.41	0.710	1.41	0.707
Availability of Computer	1.29	0.774	1.31	0.763	1.43	0.701
Mean VIF	1.29		1.34		1.36	

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.12.2 Test for Heteroscedasticity

We have utilised the Bressch - Pagan method to check the presence of heteroscedasticity. The results of the BP-test are presented in Table 4.14. After finding the F values of the model, which is more than 0.05. The null hypothesis of homoscedasticity is not rejected. This means that the

model does not fit, or it can also be concluded that the residual square is unrelated to the explanatory variables. We infer that in our dataset, residuals are homoscedastic and there is no heteroscedasticity in the model.

Table 4.14: Result of BP test for the presence of Heteroscedasticity for private school

Residual squared	Mathematics Score						English Score					
	For whole Sample		For Men		For Women		For whole Sample		For Men		For Women	
	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values	Coef.	P values
Gender	-4.993	0.194	0		0	0.282	-1.088	0.283	0		0	
Time to Study	-3.119	0.015	-3.547	0.050	-3.174	0.056	-.512	0.130	-.411	0.348	-.695	0.162
Body Mass Index	-.736	0.218	-.200	0.822	-.444	0.546	.105	0.504	-.010	0.963	.224	0.310
Years of Education	.189	0.918	-3.310	0.196	2.229	0.357	-.787	0.104	-1.891	0.003	.363	0.617
SC	-9.157	0.168	-3.455	0.716	-7.972	0.362	-1.264	0.470	1.463	0.527	-2.287	0.384
ST	4.834	0.563	10.022	0.441	2.638	0.788	-2.049	0.352	2.638	0.405	-4.900	0.097
OBC	-1.722	0.688	3.008	0.623	-6.511	0.238	-.727	0.520	1.720	0.248	-2.043	0.218
Availability of Fellowship	-.225	0.956	1.502	0.788	-4.797	0.364	.840	0.433	.275	0.839	.299	0.850
Mother's Education	-.293	0.588	.400	0.588	-.760	0.297	.135	0.344	.399	0.027	-.113	0.605
Father's Education	-.092	0.845	-.380	0.532	.374	0.584	-.203	0.104	-.448	0.003	.182	0.376
Expenditure	.00003	0.524	.0001	0.202	-.00005	0.411	-2.01e-06	0.889	-.00002	0.348	-.00001	0.598
Household size	-.766	0.438	-.115	0.920	-.551	0.762	-.634	0.015	-.654	0.020	-.388	0.478
Assets	.00008	0.277	4.11e-06	0.960	.0002	0.289	.00001	0.474	.00002	0.342	-7.61e-06	0.874
Availability of Computer	.371	0.957	17.066	0.093	-12.790	0.144	-2.623	0.148	.774882	0.753	-3.912	0.137
Constant	48.663	0.065	69.466	0.048	19.679	0.588	20.440	0.003	35.207	0.000	2.088	0.848
Number of obs.	385		212		173		385		212		173	
F	0.91(14, 370)		0.96(13, 198)		0.98(13, 159)		1.55(14, 370)		2.32(13, 198)		1.05(13, 159)	
Prob.>F	0.5445		0.4963		0.4778		0.0926		0.0069		0.4086	
R-squared	0.0334		0.0591		0.0739		0.0553		0.1322		0.0789	
Adj. R-squared	-0.0032		-0.0027		-0.0019		0.0195		0.0752		0.0036	
Root MSE	35.717		35.805		31.294		9.4172		8.7068		9.401	

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.13 A Non- Parametric Approach: Assessment of Gender-Based difference for Private School

This portion of the chapter analyses gender-based mean differences by using a non-parametric approach. A t-test is being used to analyse the gender-based mean difference for all variables individually.

Table 4.15: Gender-based means of explanatory variables for Private School

Variables	Overall	Male	Female	Difference
Mathematics Test Score	17.805 (5.737)	18.627 (5.554)	16.798 (5.814)	1.830***
English Test Score	17.262 (2.992)	17.302 (2.997)	17.214 (2.995)	0.088
Time to study	1.995 (1.566)	1.778 (1.493)	2.260 (1.616)	-0.482***
Body Mass Index	19.657 (3.161)	19.548 (2.917)	19.791 (3.441)	-0.244
Years of Education	13.330 (1.108)	13.335 (1.087)	13.324 (1.136)	0.011
SC	0.114 (0.319)	0.113 (0.318)	0.116 (0.321)	-0.002
ST	0.057 (0.232)	0.042 (0.202)	0.075 (0.264)	-0.033*
OBC	0.452 (0.498)	0.533 (0.500)	0.353 (0.479)	0.180***
Availability of Fellowship	0.577 (0.495)	0.590 (0.493)	0.561 (0.498)	0.029
Mother's Education	4.338 (4.486)	3.934 (4.316)	4.832 (4.651)	-0.898**
Father's Education	6.590 (4.973)	6.066 (5.132)	7.231 (4.706)	-1.165**
Expenditure	28613.12 (37255.46)	30173.72 (34197.87)	26700.72 (40710.82)	3472.994
Household Size	4.626 (1.920)	4.731 (2.249)	4.497 (1.413)	0.234
Assets	17737.71 (29135.54)	19663.21 (35760.06)	15378.15 (17783.85)	4285.057*
Availability of Computer	0.101 (0.302)	0.085 (0.279)	0.121 (0.328)	-0.036

Note: *p<.1, **p<.05, ***p<.01 and Standard deviations are in parentheses.

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Table 4.15 indicates that the average value of the majority of the variables have significant differences based on gender. However, there are few variables which are not significantly different from zero. The Mathematics test score has significant difference based on gender and it exhibits that the average test score for female children is less than the average test score of male children in public school by 1.830, and the difference is statistically vital. In other words, the average Mathematics test scores for female children are less than the average test scores of male children by almost 10 percent. The results indicate that the gender-based difference for English test score is statistically insignificant. In other words, there is no difference based on gender in English test score.

The time to study is also statistically significant. The result exhibits that male child spend on an average 0.482 time on study compared to females. The gender based mean difference for STs is significant and results show that male ST children are more compare to ST female by 3.3 percent. Similarly, the difference is significant for OBCs and the difference between male and female OBCs is 18 percent. The gender-based gap for availability of fellowship is statistically insignificant. Apart from these, the average years of education of mothers and fathers education for female children is higher than male children by 0.898 and 1.165 respectively. The average value of assets at household has a significant difference and it shows that the average value of the assets for female children are less than the average expenditure on education for male children by almost 21.79 percent. We see that the average values of the background variables are better for male children. In the following section, we attempt to find whether these differences influence the difference in the average test score between males and females.

4.14 Gender-Wise Statistical Description for Private Schools

Table 4.16 and 4.17 shows the descriptive statistics of the male and female children studying in private schools. Tables indicate that the average Mathematics test score is more for male students than female children, whereas the average test score for male and female students for English is almost the same. On the same line, on average, more male students have availability of fellowship than female students. Similarly, the amount spent on education in a year is more for male children than for female children. Additionally, the amount of household assets is more for the male children compared to the female children. The descriptive results are presented in graphs represented below.

Figure 4.13 presents the gender-wise average score in Mathematics and English. The average Mathematics marks score by male students is 18.6 and for female score is 16.8 which is less

than the male students. On the one hand, the average score in English for male and female students is almost same.

Figure 4.14 shows that the average number of male students from OBC background are more in private schools where 53 percent of the total male students belongs to OBC group and only 35 percent of the total female students in the private school are from OBC group. The participation of SC and ST group students are lower than the other social groups. There are more female students in private schools from ST backgrounds than male students. For the SC community the percentage for both the gender is almost same.

Figure 4.15 presents that only 56 percent of the female students have the availability of fellowship. It also shows that the more proportion of the male students have availability of the fellowship than the proportion of female students.

Figure 4.16 shows that the family's average expenditure on education in an academic year is more for the male students than the female students in private school. Similarly, the average household wealth of the male students enrolled in private school is more compared to the female students.

Table 4.16: Descriptive statistics for male for private school

Variable	N	Mean	Median	Min	Max	Std. Dev.	Skewness	kurtosis
Mathematics Test Score	212	18.627	19	1	29	5.553	-0.638	3.091
English Test Score	212	17.302	18	7	22	2.997	-0.670	3.164
Time to Study	212	1.778	2	0	8	1.493	0.956	4.469
Body Mass Index	212	19.548	18.959	13.119	31.197	2.917	1.171	5.053
Year of Education	212	13.335	14	10	15	1.087	-0.605	2.981
SC	212	0.113	0	0	1	0.318	2.442	6.961
ST	212	0.042	0	0	1	0.202	4.539	21.600
OBC	212	0.533	1	0	1	0.500	-0.132	1.018
Availability Fellowship	212	0.590	1	0	1	0.493	-0.364	1.133
Mother's Education	212	3.934	2.5	0	14	4.316	0.691	2.329
Father's Education	212	6.066	6	0	14	5.132	0.106	1.561
Expenditure	212	30173.72	15975	0	190000	34197.87	2.147	8.470
Household Size	212	4.731	4	2	26	2.249	4.800	40.850
Assets	212	19663.21	7000	300	400000	35760.06	6.744	64.878
Availability of Computer	212	0.085	0	0	1	0.279	2.978	9.871

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Table 4.17: Descriptive statistics for Female for private School

Variable	N	Mean	Median	Min	Max	Std. Dev.	Skewness	kurtosis
Math Test Score	173	16.798	18	2	28	5.814	-0.461	2.603
English Test Score	173	17.214	18	10	22	2.995	-0.490	2.675
Time to Study	173	2.260	2	0	9	1.616	0.610	4.154
Body Mass Index	173	19.791	18.934	14.128	35.145	3.441	1.469	5.989
Year of Education	173	13.324	14	10	16	1.136	-0.300	2.418
SC	173	0.116	0	0	1	0.321	2.404	6.781
ST	173	0.075	0	0	1	0.264	3.223	11.389
OBC	173	0.353	0	0	1	0.479	0.617	1.381
Availability Fellowship	173	0.561	1	0	1	0.498	-0.245	1.060
Mother's Education	173	4.832	5	0	14	4.651	0.365	1.775
Father's Education	173	7.231	9	0	14	4.706	-0.288	1.865
Expenditure	173	26700.72	14390	0	442200	40710.82	6.594	64.413
Household Size	173	4.497	4	1	10	1.413	0.763	4.788
Assets	173	15378.15	7000	300	100000	17783.85	2.028	7.677
Availability of Computer	173	0.121	0	0	1	0.328	2.319	6.376

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

Figure 4.13: Subject-Wise Average Marks Scored by Students of Private School

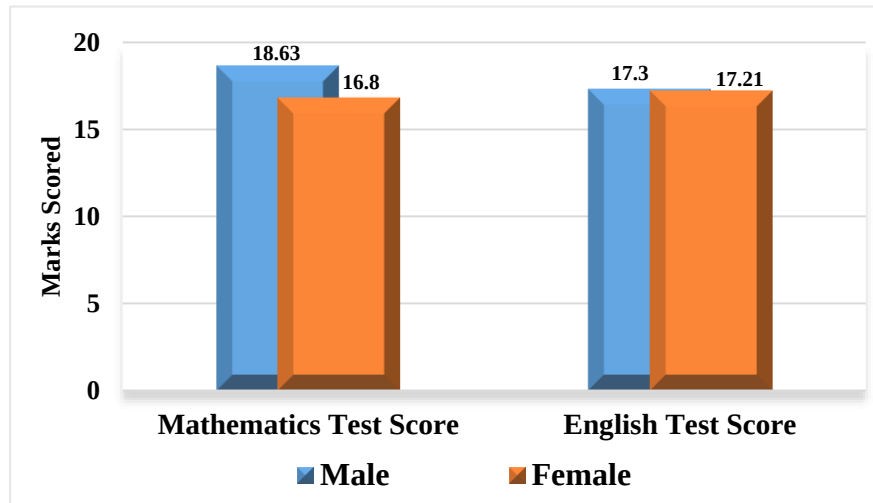


Figure 4.14: Gender-Wise Percentage of Private School Students from Different Social Groups

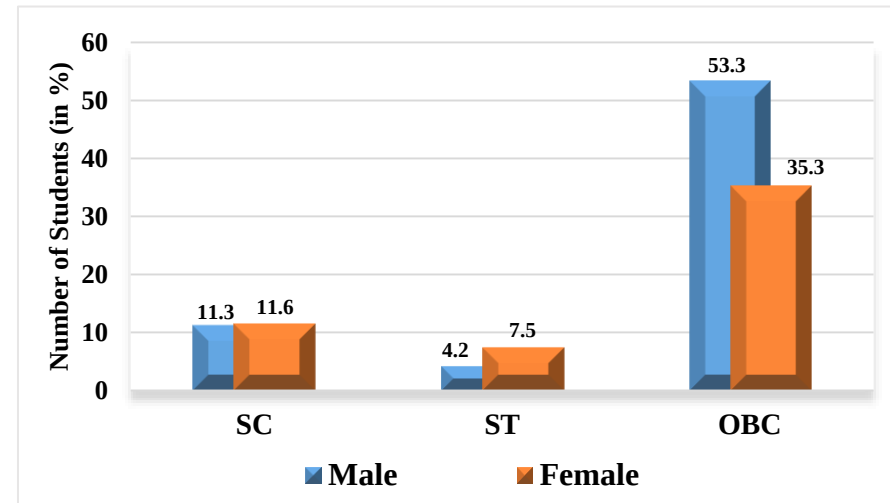


Figure 4.15: Gender-Wise Percentage of Private School Students having Availability of Fellowship

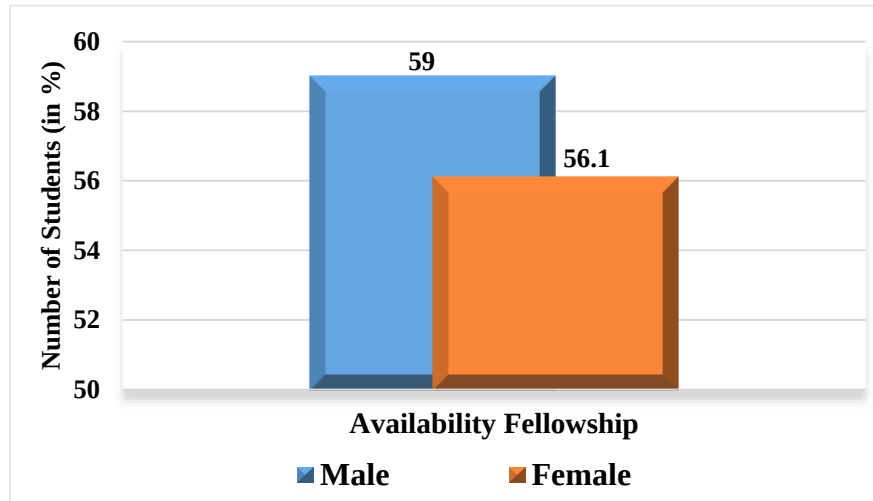
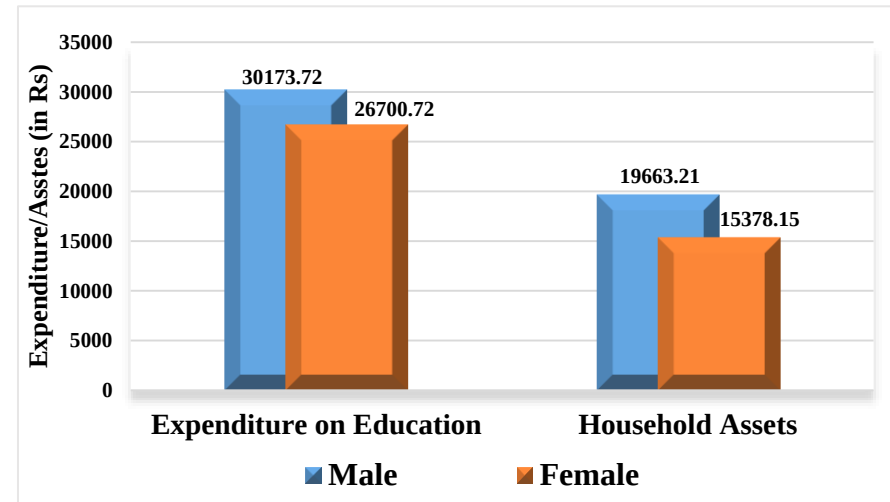


Figure 4.16: Gender-Wise Average Expenditure on Education and Value of Household Assets of Private School Students



Source: Calculated using YLS data for older cohort for India, 2013.

4.15 Factors Causing Gender Gap in Performance of Private School Children

It is visible in the above gender-based mean difference for the explanatory variable for the private school children that the dummy variable gender has a significant effect on children's educational performance enrolled in private school. The descriptive statistics for male and female children enrolled in public school are shown in Table 4.16 and Table 4.17, respectively.

Now, using equation (4.2) for the children studying in private school:-

$$R = \{E(P_{M_{Pvt}}) - E(P_{F_{Pvt}})\}' \beta_{M_{Pvt}} + E(P_{M_{Pvt}})' (\beta_{M_{Pvt}} - \beta_{F_{Pvt}}) + \{E(P_{M_{Pvt}}) - E(P_{F_{Pvt}})\}' (\beta_{M_{Pvt}} - \beta_{F_{Pvt}}) \quad \dots (4.3)$$

Above equation is a “threefold” decomposition, i.e., the outcome difference is categorised into three components for the private school children,

$$R_{Pvt} = E + C + I$$

The first component,

$$E = \{E(P_{M_{Pvt}}) - E(P_{F_{Pvt}})\}' \beta_{M_{Pvt}}$$

amount to the part of the differential that is due to group differences in the predictors (the “*endowment effect*”).

The second component, $C = E(P_{M_{Pvt}})' (\beta_{M_{Pvt}} - \beta_{F_{Pvt}})$ measures the contribution of differences in the coefficient (including differences in the intercept).

And the third component, $I = \{E(P_{M_{Pvt}}) - E(P_{F_{Pvt}})\}' (\beta_{M_{Pvt}} - \beta_{F_{Pvt}})$, is an intercept term accounting that differences in endowments and coefficient exist simultaneously between the two groups.

The Blinder-Oaxaca decomposition (4.3) is shown in Table 4.18. The Mathematics test score difference between male and female children is 0.319 standard deviations. We see that this difference, total 0.319 standard deviation, is primarily and only because of the coefficient effect (significant at 1 percent level of significance). The contribution of this effect is 116.61 percent of the total difference or 0.372 out of 0.319 standard deviations. Contrary to this B-O decomposition also shows that for the English test score difference between male and female children is insignificant

The decomposition result assesses the groups' mean predictions and their difference in the first section. In our analysis, the mean of Mathematics test score is 3.245 for males and 2.926 for females children, yielding a performance gap of 0.319 for Mathematics.

In the second panel of the decomposition output, the performance gap is divided into three parts. The first part reflects the mean increase in the female children's performance if they had the same characteristics as male children. The second term quantifies the change in female children's performance when applying the male's coefficient to the female's characteristics. The third part is the intersection term that measures the simultaneous effects of difference in endowment and coefficient effect. Even though we have found that the average values of the variables are significantly different (Table 4.18) and better for male children, this difference does not explain or contribute to the difference in the average scores between them. It explains the difference in the average impact or returns to the average values of those background characteristics. In other words, the difference in the extent of pressure put upon the test score explains 116.64 percent (2.136 out of the total difference of 1.830) of the mean performance difference between males and females.

The endowment effect (i.e. the difference between the two groups in the mean values of the child) has almost no effect (-0.108 standard deviation: not statistically different from zero).

Table 4.18: Blinder-Oaxaca Decomposition Results for Mathematics and English Test Score

	Mathematics Test Score			English Test Score		
	Raw Test score	Standardised Test Score	P value	Raw Test score	Standardised Test Score	P value
	Coefficient	Coefficient		Coefficient	Coefficient	
Male	18.627	3.245	0.000	17.302	7.656	0.000
Female	16.798	2.926	0.000	17.214	7.617	0.000
Difference	1.830	0.319	0.002***	0.088	0.039	0.780
Endowment Effect						
$\{E(P_{M_{Pvt}}) - E(P_{F_{Pvt}})\}' \beta_{M_{Pvt}}$	-0.621	-0.108	0.133	-0.304	-0.135	0.135
Coefficient Effect						
$E(P_{M_{Pvt}})'(\beta_{M_{Pvt}} - \beta_{F_{Pvt}})$	2.136	0.372	0.000***	-0.361	0.160	0.228
Interaction Effect						
$\{E(P_{M_{Pvt}}) - E(P_{F_{Pvt}})\}'(\beta_{M_{Pvt}} - \beta_{F_{Pvt}})$	0.314	0.055	0.412	0.031	0.014	0.879

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.16 Factors Contributing to the Gender-Gap in Educational Performance for Private School Children

Table 4.19 shows the results of the detailed Blinder-Oaxaca decomposition. We have discussed before that the endowment and interaction effects are not statistically significant for Mathematics test score in our results. However, the coefficient effect is significant at 1 percent level of significance. The results do not explain what factors contributes to the coefficient effect.

The second panel of the Table 4.19 presents the outcome of the detailed Blinder-Oaxaca decomposition for the Mathematics test score. We have discussed that the coefficient effects are statistically significant in our results. However, the coefficient is significant at 1 percent levels of significance. In coefficient effect, the variable years of education and mother's education are significant at 5 and 10 percent significance level. We find it is just the years of education and mother's education at the time of the survey, which plays a crucial role in explaining the difference in the average Mathematics test score based on gender. We find years of education contribute 662.63 percent of the total coefficient effect.

On the other hand, mother's education contributes negatively with 60.48 percent to the coefficient effect. In other words, out of the total difference of 0.372, years of education contribute 2.465 and Mother's education contributed -0.225 standard deviation to coefficient effect. We find differential returns to the same average years of education based on gender, where it is greater for the male children than the females. We also find that differential returns to the same average mother's education based on gender are more remarkable for the female children than the male children. Most of the previous literature have neither discussed nor included the years of education and mother's education variable. This inclusion in our analysis shows a significant role in the Mathematics performance of a child.

Table 4.19: Detailed Blinder-Oaxaca Decomposition for Mathematics and English Test Score for Private School Students

	Mathematics Test Score						English Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect		Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to Study	-0.084	0.019	-0.057	0.684	0.012	0.687	-0.059	0.102	-0.028	0.882	0.006	0.882
Body Mass Index	0.005	0.556	0.608	0.293	-0.007	0.545	0.004	0.646	0.719	0.358	-0.009	0.565
Years of Education	0.001	0.922	2.465	0.041**	0.002	0.922	0.001	0.922	1.537	0.346	0.001	0.922
SC	0.000	0.942	0.020	0.609	-0.000	0.942	0.001	0.942	0.042	0.422	-0.001	0.942
ST	0.022	0.239	0.013	0.667	-0.006	0.680	0.010	0.495	0.038	0.372	-0.017	0.449
OBC	-0.007	0.814	0.013	0.857	-0.007	0.857	-0.021	0.579	0.033	0.740	0.017	0.741
Availability of Fellowship	0.001	0.904	-0.064	0.566	-0.003	0.686	-0.006	0.615	0.079	0.599	0.004	0.699
Mother's Education	-0.028	0.234	-0.225	0.084*	0.042	0.194	-0.052	0.155	-0.219	0.212	0.041	0.292
Father's Education	-0.023	0.342	0.071	0.681	-0.011	0.686	-0.014	0.647	0.221	0.344	-0.036	0.381
Expenditure	0.013	0.411	-0.060	0.405	-0.007	0.541	0.017	0.414	0.168	0.088	0.022	0.427
Household Size	0.005	0.711	-0.108	0.678	-0.006	0.694	0.003	0.871	-0.007	0.984	-0.000	0.984
Assets	-0.006	0.770	-0.005	0.945	-0.001	0.945	-0.011	0.668	-0.004	0.966	-0.001	0.966
Availability of computer	-0.08	0.495	0.012	0.778	-0.004	0.784	-0.006	0.652	0.046	0.414	-0.014	0.500
Total	-0.108	0.133	0.372	0.000***	-0.052	0.412	-0.135	0.135	0.160	0.228	0.014	0.879

Note: *p<.1, **p<.05, ***p<.01

Source: Author's own interpretation using YLS data for older cohort for India, 2013.

4.17 Conclusion

The study used the young lives survey data of fourth round for the older cohort to explain the large and persistent academic performance gap between males and females in public and private school children in India. The study found a gender-based gap in Mathematics learning outcomes for both public and private school children. The gender gap in learning outcomes is lesser in private schools compared to public school children. Using the threefold Blinder-Oaxaca decomposition, in the case of public schools, for both Mathematics and English, the study shows that most of the performance difference between them is because of the coefficient effect or the differential returns to the background characteristics. The contribution of coefficient effect is 85.96 and 98.71 percent of the total difference for Mathematics and English test scores. However, the coefficient effect is significant for Mathematics, but the results do not explain what factors contributes to the coefficient effect. On the other hand, the household size contributes significantly for English test scores.

Similarly, in the case of private schools, the result shows that majority of the performance difference for Mathematics test scores between them is because of the differential returns to the background characteristics (coefficient effect). The contribution of the coefficient effect is 116.6 percent of the total difference. In this coefficient effect, the study finds differential returns to the same average years of education based on gender, where it is greater for the male children than the females. The study also indicates that differential returns to the same average mother's education based on gender are greater for the female children than the male children. On the other hand, Blinder-Oaxaca decomposition shows that the difference between male and female children for English test score is insignificant.

CHAPTER-V

Gender Gap in Educational Performance: A Micro-Level Analysis

“The education and empowerment of women throughout the world cannot fail to result in a more caring, tolerant, just and peaceful life for all.”

-African Proverb

Abstract

The findings of the Young Lives Survey for Round 5 (2017) indicate that gender is a significant factor in children's academic performance in erstwhile Andhra Pradesh, where boys are scoring better grades than girls. This chapter analyses the educational performance of the children belonging to the marginalised groups and identifies which social group has more significant gender disparity and the variables causing this gap in educational performance. The chapter addresses these questions using the data collected through a primary survey using multi-stage sampling. The sample size is 270 (130 from Mancherial and 140 from Prakasham district) collected from 16 villages of four mandals of two districts of Telangana and Andhra Pradesh. Initial findings using the non-parametric test (T-test) shows that the gender-based mean difference of marks scored is significant. On average, male students' overall performance is high compared to female students. The same trend is visible in Mathematics, English, Social Science, and Science for Telangana and Andhra Pradesh (the difference is insignificant for English).

Further, the study has used the threefold Blinder-Oaxaca decomposition technique. Findings show that the difference between the average test score and Mathematics, English, Social Science, Science is significant. The difference is due to the coefficient effect, or the differential returns to the background characteristics (except Science) for the Mancherial district, Telangana. Decomposition results indicate that different factors for different subjects contribute to the gender gap. The BMI significantly contributes to the gender gap for all the subjects, including the child's average performance. Mother's education and mid-day meals significantly contribute to the average and Mathematics performance. Blinder-Oaxaca results show that the difference for the Average test, Mathematics, and Social Science is significant. The gender difference in the Mathematics and Social Science performance is due to the coefficient effect, or the differential returns to the background characteristics. Both Time spent on study and Mid-day meal significantly contributed to the gender difference in both Mathematics and Social science test score. Apart from this, BMI and type of school are also contributing to the gap for Social Science.

5.1 Introduction

This chapter analyses the data collected through the primary survey conducted in 16 Andhra Pradesh and Telangana State villages from February to September 2021. The study has collected data to measure the gender gap in educational performance using multi-stage (random) sampling. The total sample is 270 from 16 villages of four mandals – Jaipur and Chennur in the Mancherial district of Telangana; Maddipadu and Tangutur in Prakasham district of Andhra Pradesh. The survey was carried out to measure gender-gap in education performance among the marginalised population in Andhra Pradesh and Telangana. It also aims to identify the factors contributing to the gender gap in educational performance in Andhra Pradesh and Telangana.

The state of Andhra Pradesh was bifurcated in 2014 a separate Telangana State was formed. The objective of the study is to analyse the gender gap in educational performance among marginalised groups. Mancherial and Prakasham districts of Telangana and Andhra Pradesh have the highest proportion of the SC population. However, YLS collected data from seven districts that have not included the Mancherial and Prakasham districts.

5.2 Methodology and Data Source

In this study, educational performance is measured considering the marks in mathematics, English, Social Science, and Science in the previous class exam conducted by the respective schools. The study has collected data through a primary survey using multi-stage sampling. The sample size is 270, and it was collected from 16 villages of four mandals of two districts of Telangana and Andhra Pradesh. 130 samples are collected from Mancherial district, Telangana and 140 samples from Prakasham district, Andhra Pradesh.

Table 5.1 describes the dependent and explanatory variables—child-specific features such as gender, BMI, social-economic background, and years of education. Parental education includes the education level achieved by the mother and father of the child. Household features include household size, availability of the computer at the house, expenditure on education, household assets. Other features refer to the type of school, medium of instruction, availability of the fellowship, and mid-day meal.

Child Specific features include gender of the child, time spent on study by the child, nutrition level of the child, and social background. The study has created the dummy variables for the gender (=1

if male, 0 otherwise). The study also created a dummy for the region (=1 if Andhra Pradesh, 0 otherwise), we created three dummies for the social groups of the child belongs to (=1 if the child belongs to SC category, 0 otherwise), (=1 if the child belongs to ST category, 0 otherwise), (=1 if the child belongs to OBC category, 0 otherwise). The variable Time to study refers to the Time spent on studying a child apart from school hours¹³. The study has utilised the child's height-for-weight BMI score to measure childhood nutrition.¹⁴ Researchers find it “one of the best indicators of cumulative nutritional status for infants and children” (Glewwe *et al.*, 2001; McKee and Todd, 2009). BMI is calculated by taking the weight and squared height ratio in kg and height in meters. The years of education mean years of schooling a child has received at the time of the survey.

In addition, the variables were segregated in parental education. Parental education refers to the mother's and father's education. Parents' education is taken in completed years (number of years).

Furthermore, Household characteristics include expenditure on education, household size, the value of assets, and availability of the computer. Expenditure on education indicates the total amount spent in the last academic year by a household on a child's education. To calculate the total expenditure on education, the study has added all the expenses on education reported by the head of the household during the last academic year¹⁵. The study has also considered household size as previous research shows that household size affects education performance because of limited parental and economic resources. The value of household assets¹⁶ is also used in the study. It is calculated by summing the five most valuable assets in the household.

Lastly, other features comprise the type of school, medium of instruction, availability of the fellowship, and availability of the mid-day meal in the school. The study has created a dummy for these variables. A dummy variable is created for the type of school (=1 if the school is government,

¹³ How much time a child has spent in doing homework or studying at home during a typical day, not a weekend or holiday, in hours

¹⁴ If the value for BMI is less 18.5 kg/m² child is consider as underweight, if the value is between 18.5 kg/m² 24.9 kg/m² child is considered as normal. If the BMI is 25 kg/m² to 30 kg/m², it fall under overweight range. If the BMI is greater than or equal to 30 kg/m² it falls within obesity range. <https://www.cdc.gov/obesity/adult/defining.html>

¹⁵ These expenses includes Registration fee, examination fee, tuitions fee, other fee like donation, consolidated education charges, payment for private tuition, payment for food at school, transportation charges, accommodation fee, other equipment (laptop), and other expenditure like uniforms, books , and stationary.

¹⁶ Value of assets refers to the present market value of the vehicle, cart, cow/buffalo, Gas cylinder, fan, fridge, TV, Motor pump, etc. owned by the household.

0 otherwise. Another dummy is being created based on the medium of instruction in school (=1 if the medium is English, 0 otherwise). Whether a child is availing fellowship or not, a dummy variable is being created for the same (=1 if yes, 0 otherwise). Similarly, if the child is receiving a mid-day meal or not, the dummy variable is created for the same, i.e. (=1 if yes, 0 otherwise).

Table 5.1: Description of Variables

Variables		Description
<i>Dependent Variables</i>		
Overall Test Score		Average test score in the four subjects
Mathematics Test Score		Marks scored in the previous class in Mathematics.
English Test Score		Marks scored in the previous class in English.
Social Science Test Score		Marks scored in the previous class in Social Science.
Science Test Score		Marks scored in the previous class in Science.
<i>Explanatory Variables</i>		
Child Specific Features	Gender	= 1 if male, 0 otherwise
	Region	= 1 if Andhra Pradesh, 0 otherwise
	Time to Study	How many hours a child spends studying apart from school hours.
	Body Mass Index	The proportion of weight (in kg) and squared height (in meters) of the child.
	Years of Education	Years of schooling a child has received at the time of the survey.
	SC	= 1 if SC, 0 otherwise
	ST	= 1 if ST, 0 otherwise
	OBC	= 1 if OBC, 0 otherwise
Parental Education	Mother's Education	No. of years child's mother's education.
	Father's Education	No. of years child's father's education.
Household Features	Expenditure	Total amount spent in the last academic year by family on education (in Rupees).
	Household size	No. of members in the family.
	Assets	Total of five most valuable assets owned by household (in Rupees).
Other Features	Type of School	Whether a child is studying in a government school or other. =1 if yes, 0 otherwise
	Medium of Instruction	Whether the medium of instruction is English or other. =1 if yes, 0 otherwise
	Fellowship	Whether a child is getting any fellowship or not. =1 if yes, 0 otherwise
	Mid-Day Meal	Whether the child is receiving the mid-day meal in school =1 if yes, 0 otherwise

5.3 Micro Analysis- Telangana

The sample size for the Mancherla district, Telangana, is 130. The children's marks in mathematics, English, Social Science, and Science, on average, are about 66, 66, 68, and 67, with a median value of around 60, 65, 70, and 65, respectively (Table 5.2). The range for the mathematics test score is 70 (100 – 30), with the standard deviation from the mean being about 17. Similarly, The range for the English, Social Science, and Science test score is 65 (100 – 35), with the standard deviation from the mean, which is about 17 for all.

The variable Gender shows that the study has included almost 55 percent of male and 45 percent of female students (see Table 5.2, Gender=0.554). Similarly, dummy variables SC, ST, and OBC reflect that about 49 percent, 18 percent, and 32 percent of the children in our data set belongs to SC, ST, and OBC categories, respectively. On average, a child's Time spent on study apart from the time spent in school is approximately 2 hours, with a median value of 2. The range for the Time spent on study is 4 (4 – 0), with a standard deviation of about 0.896 from the average value. The BMI of the children, on average, is about 18.75, with a median value of about 18 kg/m². The deviation of the BMI from the mean value is about 3.6 kg/m². On average, the children's years of education is about 9 years, with a median value of 9 years. The years of education received by the children is between 6 to 12 years range, with a standard deviation of about 2 years from the mean years of education.

The total amount spent on education by family in the last academic year is approximately ₹ 5,346 on average. The range for the total expenditure on education is ₹ 1,72,000, with a standard deviation of about ₹ 20,629. The family's household size is about four members on average. The average value of the five assets in the household is about ₹ 76,852, with a median value of ₹ 48,750. The deviation from the mean value is approximately ₹ 1,17,535.

Almost 88 percent of students are studying in a government school. Furthermore, the availability of the fellowship for the students shows sad results; only 10 percent of students are receiving the fellowship. Lastly, on average, 86 percent of the students receive mid-day meals in the school.

Table 5.2: Descriptive Statistics for Mancherla District, Telangana State

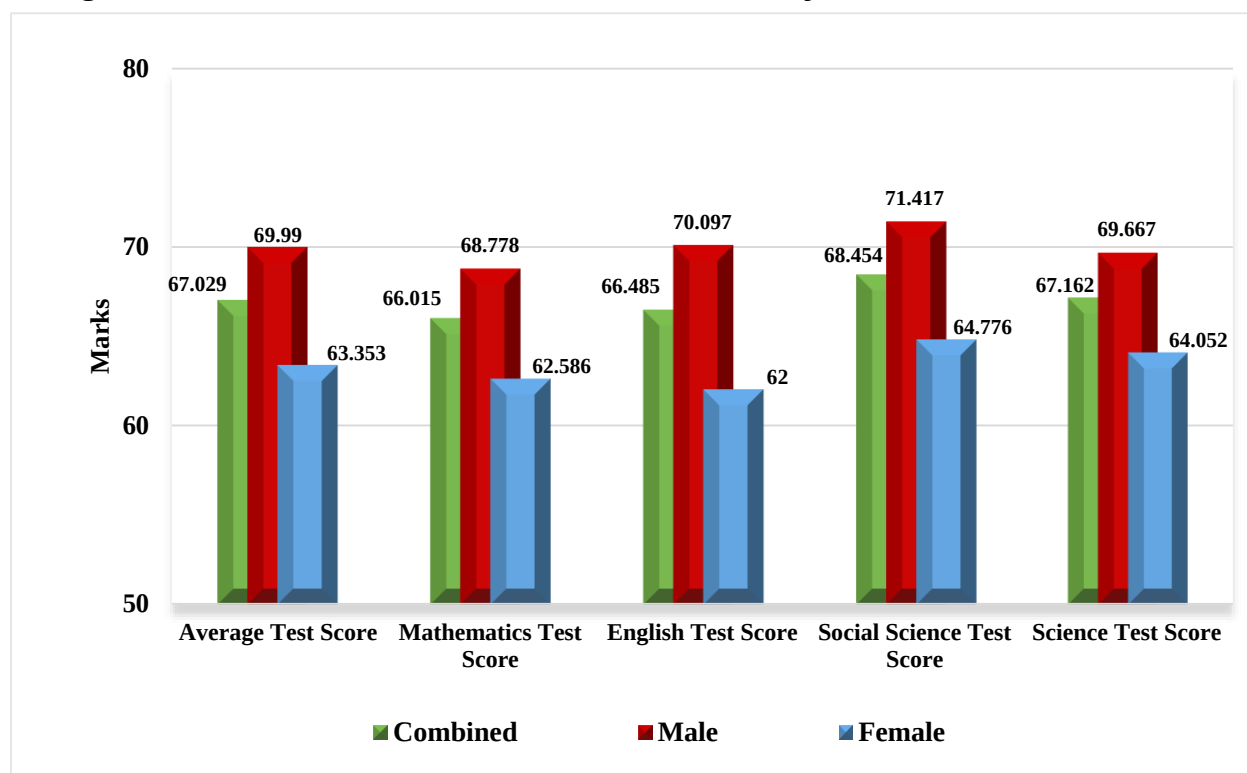
Variable	N	Mean	Median	Min	Max	Std. Dev.	Skewness	kurtosis
Average Test Score	130	67.029	67.125	36.25	100	14.890	0.215	2.525
Mathematics Test Score	130	66.015	60	30	100	16.653	0.220	2.324
English Test Score	130	66.485	65	35	100	16.973	0.150	2.275
Social Science Test Score	130	68.454	70	35	100	16.510	0.136	2.414
Science Test Score	130	67.162	65	35	100	17.269	0.126	2.261
Gender	130	0.554	1	0	1	0.499	-0.217	1.047
Time to Study	130	1.858	2	0	4	0.896	0.286	1.895
Body Mass Index	130	18.754	18.083	11.039	27.900	3.623	0.616	2.829
Year of Education	130	9.131	9	6	12	1.910	-0.221	1.837
SC	130	0.492	0	0	1	0.502	0.031	1.001
ST	130	0.185	0	0	1	0.389	1.626	3.643
OBC	130	0.323	0	0	1	0.469	0.757	1.573
Mother's Education	130	3.446	2	0	15	4.132	0.872	2.432
Father's Education	130	4.385	3	0	15	4.545	0.681	2.234
Expenditure	130	5345.923	0	0	172000	20628.71	5.865	41.552
Household Size	130	4.492	4	2	7	0.974	1.006	4.131
Assets	130	76851.54	48750	3500	649000	117535.3	3.535	15.622
Type of School	130	0.877	1	0	1	0.330	-2.295	6.265
Medium of Instruction	130	0.562	1	0	1	0.498	-0.248	1.062
Availability of Fellowship	130	0.1	0	0	1	0.301	2.667	8.111
Mid-Day Meal	130	0.862	1	0	1	0.347	-2.094	5.383

Source: Calculated using Primary Survey data, 2021.

5.3.1 Gender-wise Descriptive Statistics

Figure 5.1 reflects that the average marks scored by male students are higher than marks scored by female students. For mathematics tests, female students' average marks are lower than the combined marks and even lower than male students. The study also finds a similar gap in average marks scored by students in social Science and Science, where female students score lower than male students.

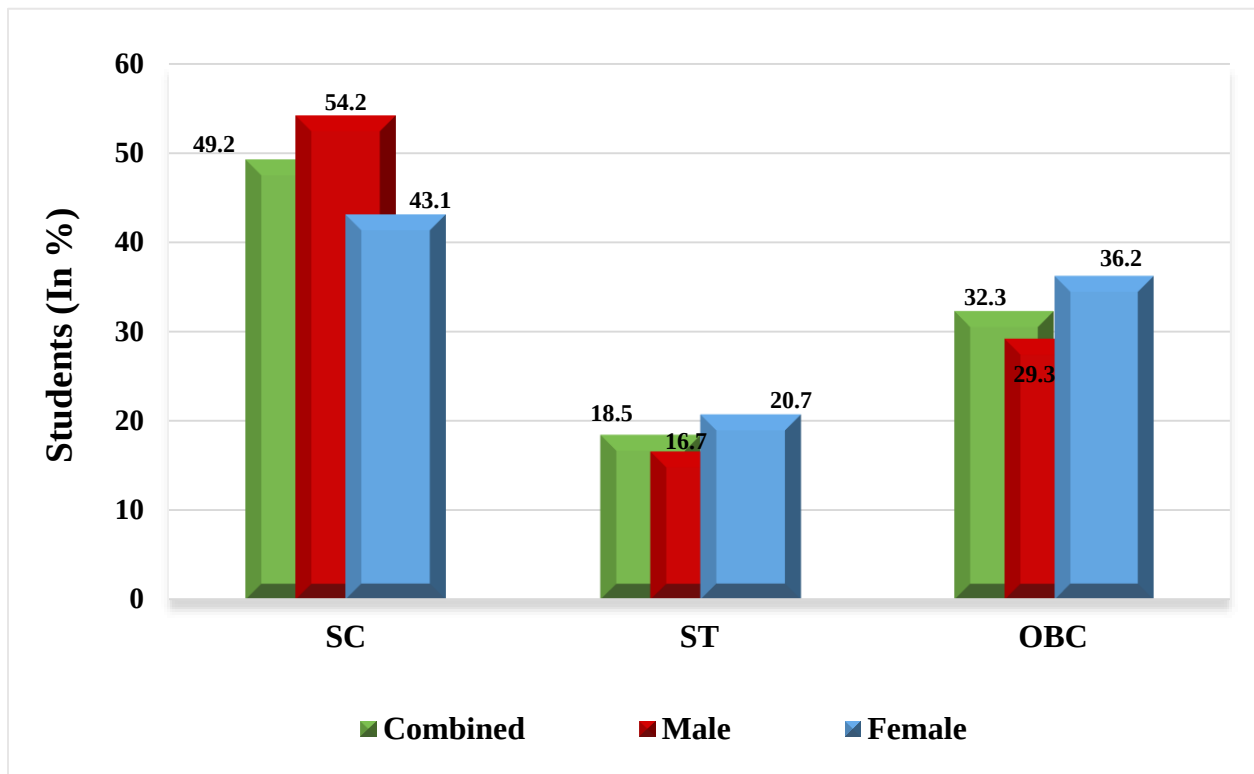
Figure 5.1: Gender-Wise Performance in Different Subjects for Mancherial District



Source: Calculated using Primary Survey data, 2021.

The above Figure 5.2 displays the percentage of the students enrolled in school from different social groups in the Mancherial district. In the total sample covered around 50 percent of students from scheduled caste, approximately 54 percent are male, and 43 percent are female students. 18.5 percent of students from scheduled tribes, in which almost 17 percent are male, and 21 percent are female students. 32 percent of the total sample belongs to the other backwards castes; approximately 29 percent are male, and 36 percent are female students.

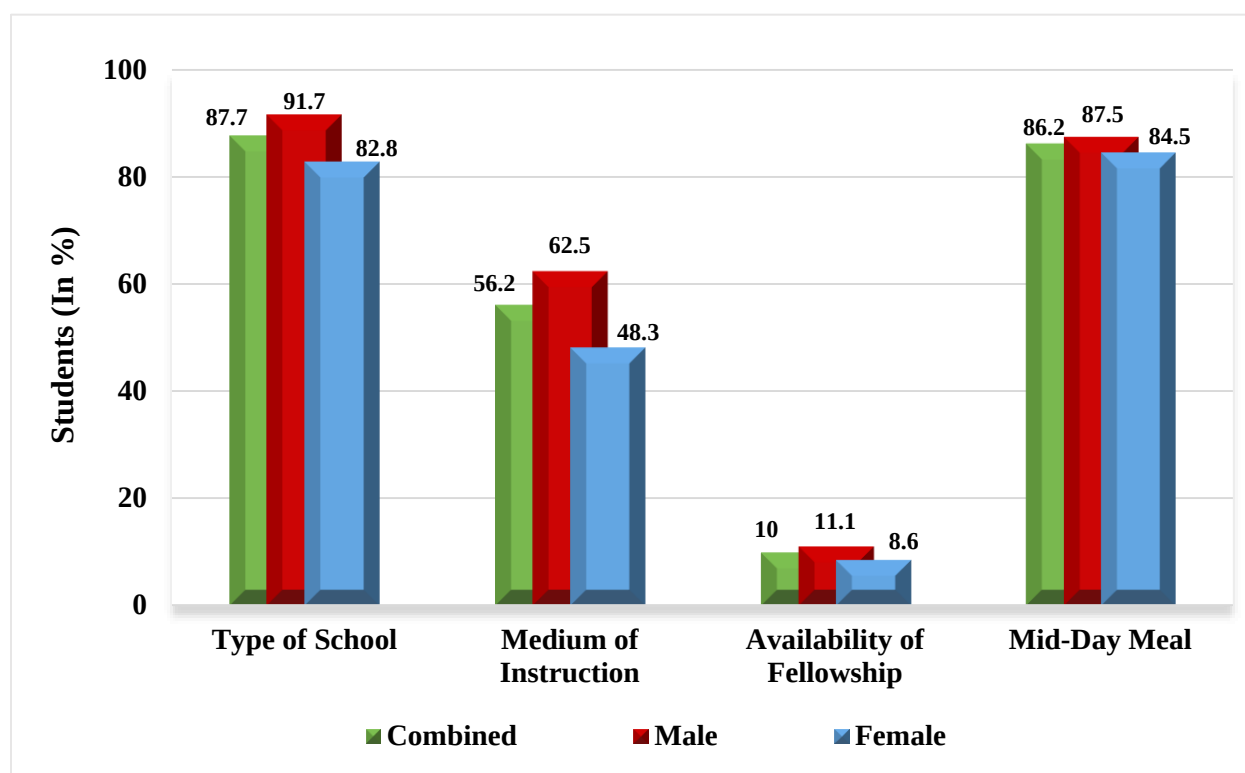
Figure 5.2: Gender-Wise Enrolled Students from different Social Groups for Mancherial District



Source: Calculated using Primary Survey data, 2021.

Figure 5.3 displays the gender-wise percentage of the students studying in government schools, the gender-wise percentage of the students studying in English medium school, the gender-wise percentage of students having the availability of the fellowship, and the gender-wise percentage of the students having access mid-day-meal, in the district of Mancherial.

Figure 5.3: Gender-Wise percentage of Students concerning the Dummy variables for Mancherial District



Source: Calculated using Primary Survey data, 2021.

Figure 5.3 reflects that, on an average, almost 88 percent of the students are studying in government schools, about 92 percent of the male are in government schools, whereas 83 percent of the females are in government schools. On average, 56 percent of the students are in English medium schools, approximately 63 percent of the male and 48 percent of the female students are studying in English medium. It shows that more male students study in English medium schools than female students. Overall only 10 percent of the students have availability of the fellowship, only 11 percent of the male and just 9 percent of the female have fellowship. About 14 percent of the students are not having access to the mid-day meal, 13 percent male, and 84 percent of the female are not getting mid-day meals in the district of Mancherial.

5.4 Statistical Analysis of gender Based Mean Difference using T-Test for Telangana

Table 5.3 indicates that the average value of the majority of the variables has insignificant differences based on gender. However, there are a few variables that have significant mean

differences. The mathematics, English, Social Science, and Science test score has significant difference based on gender, and it exhibits that the average performance for female children is less than the average test score of male children by 6.192, 8.097, 6.641, and 5.615 units, respectively and differences are statistically significant at 5 percent of the level of significance for all. In other words, the average mathematics test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 9 percent, and the difference is statistically vital. The average English test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 11.55 percent, and the difference is statistically vital.

The average social science test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 9.30 percent. Similarly, the average science test score has a statistically significant difference, and it shows that the average test scores for female children compared to male children are lower by almost 8 percent.

It is also reflected that the gender-based difference for Time spent on study apart from school is also significant. It shows that male children spend more time studying apart from school than female students by 0.241 hours. Perhaps this gap is because female students have to take care of the domestic cores compared to male students. Expenditure on education has a significant difference and expenditure on education for male students is about four times higher than the female students. The difference in the type of school is statistically significant, and it shows that 9 percent more female children are studying in government school compared to male children. The difference in the medium of instruction is also significant, and the mean difference shows that more (14 percent) male children are studying in English medium schools compared to female children.

Table 5.3: Gender-Based Means of Explanatory Variables for Telangana

Variables	Overall	Male	Female	Difference
Average Test Score	67.0289 (14.890)	69.990 (14.172)	63.353 (15.060)	6.636***
Mathematics Score	66.015 (16.654)	68.778 (16.164)	62.586 (16.752)	6.192**
English Score	66.485 (16.973)	70.097 (15.835)	62 (17.399)	8.097***
Social Science Score	68.454 (16.510)	71.417 (16.404)	64.776 (16.027)	6.641**
Science	67.162 (17.269)	69.667 (17.029)	64.052 (17.202)	5.615**
Time to study	1.858 (0.896)	1.965 (0.889)	1.724 (0.894)	0.241*
Body Mass Index	18.754 (3.623)	18.392 (3.774)	19.203 (3.405)	-0.811
Years of Education	9.131 (1.910)	8.944 (1.978)	9.360 (1.813)	-0.418
SC	0.492 (0.502)	0.542 (0.502)	0.431 (0.500)	0.112
ST	0.185 (0.389)	0.167 (0.375)	0.207 (0.409)	-0.040
OBC	0.323 (0.469)	0.292 (0.458)	0.362 (0.485)	-0.070
Mother's Education	3.446 (4.132)	3.542 (4.080)	3.328 (4.228)	0.214
Father's Education	4.385 (4.545)	4.097 (4.361)	4.741 (4.778)	-0.644
Expenditure	5345.923 (20628.71)	9295.69 (29790.79)	2164.167 (6137.372)	7131.523**
Household Size	4.492 (0.974)	4.556 (0.977)	4.414 (0.974)	0.142
Assets	76851.54 (117535.3)	82886.21 (136641.41)	71990.28 (100282.9)	10895.93
Type of School	0.877 (0.330)	0.828 (0.381)	0.917 (0.278)	-0.089*
Medium of Instruction	0.562 (0.498)	0.625 (0.488)	0.483 (0.504)	0.142*
Availability of Fellowship	0.1 (0.301)	0.111 (0.316)	0.086 (0.283)	0.025
Mid-Day Meal	0.862 (0.347)	0.875 (0.333)	0.845 (0.365)	0.030

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

5.5 Factors Causing Gender-Gap in Educational Performance for Telangana

It is visible in the above gender-based mean difference for the explanatory variable for the Mancheria that the dummy variable gender has a significant effect on children's educational performance. Therefore, the dataset is categorised into two groups, i.e., male and female children. The gender-wise graphic representation of the children for the Mancheria district, Telangana, are shown in Figure 5.1, Figure 5.2 and Figure 5.3.

This study aims to analyse the factors contributing to the difference between the expected values of these subsets that can be determined using the threefold decomposition. There are two subsets of samples in the study, the Male (M) and Female (F), outcome variable performance (P), and a set of the predictor (explanatory variables).

$$R = \{E(X_M) - E(X_F)\}'\beta_F + E(X_F)'(\beta_M - \beta_F) + \{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$$

The first component,

$$E = \{E(X_M) - E(X_F)\}'\beta_F$$

measure the portion of the difference that occurred due to the group differences in the predictors (the "*endowments effects*"). It measures the performance gap due to the difference in the background characteristics of a male and female child, which apply to female children's impact.

The second component,

$$C = E(X_F)'(\beta_M - \beta_F)$$

measures the contribution of differences in the coefficient (including differences in the intercept). In our analysis, 'C' indicates how much of the test score gap is due to the difference in the variation of the mean outcome of male and female children, applied to the impact of female children.

And the third component,

$$I = \{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$$

is an interaction term accounting for differences in endowments and coefficient exist simultaneously between the two groups. The third term, $\{E(X_M) - E(X_F)\}'(\beta_M - \beta_F)$ measures the contribution to the test score gap of difference between male and female students in the impact of background characteristics on learning, applied to the difference in the average characteristics of male and female students $\{E(X_M) - E(X_F)\}$.

The result of the Blinder- Oaxaca decomposition is shown in Table 5.4. The mathematics test score difference between male and female children is 0.372 standard deviations. We see that this difference is primarily and only because of the coefficient effect (significant at 5 percent level of significance). The contribution of this effect is 116.67 percent of the total difference. The English test score difference between male and female children is 0.477. The coefficient effect is significant at a 5 percent significance level. The difference is mainly because of the coefficient effect, and it contributes almost 99.58 percent of the total difference. Similarly, the Social Science test score difference between male and female children is 0.402. The coefficient effect is significant at a 5 percent significance level. The difference is mainly because of the coefficient effect. The coefficient effect contributes almost 90.05 percent of the total difference.

On the other hand, the difference based on gender in science test scores is 0.325 standard deviation, and the difference is statistically significant at a 10 percent level of significance.

In our analysis, the mean Mathematics score is 4.131 for males and 3.759 for female children, yielding a performance gap of 0.372. The mean English test score is 4.131 for males and 3.654 for female children, yielding a performance gap of 0.477. The mean Social Science test score is 4.326 for males and 3.923 for female children, yielding a performance gap of 0.402. Similarly, the mean science test score is 4.034 for males and 3.709 for female children, and the difference in the mean score is 0.325.

Table 5.4: Blinder-Oaxaca Decomposition Results for Average, Mathematics, English, Social Science, and Science Score

	Average Score		Mathematics Score		English Score		Social Science Score		Science Score	
	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value
Male	4.619	0.000	4.131	0.000	4.131	0.000	4.326	0.000	4.034	0.000
Female	4.203	0.000	3.759	0.000	3.654	0.000	3.923	0.000	3.709	0.000
Difference	-0.416	0.049**	-0.372	0.049**	-0.477	0.011**	-0.402	0.035**	-0.325	0.089*
Endowment Effect $\{E(P_M) - E(P_F)\}'\beta_M$	-0.159	0.505	-0.142	0.505	-0.134	0.518	0.088	0.697	0.065	0.773
Coefficient Effect $E(P_M)'(\beta_M - \beta_F)$	-0.485	0.021**	-0.434	0.021**	-0.475	0.012**	-0.362	0.087*	-0.311	0.149
Interaction Effect $\{E(P_M) - E(P_F)\}'(\beta_M - \beta_F)$	0.228	0.380	0.204	0.380	0.131	0.597	-0.128	0.623	-0.080	0.763

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

[#] Standardised Test Score

For the Mathematics test score, even though we have found that the average values of the variables are significantly different (Table 5.4) and better for male children, this difference does not explain the difference in the average scores between them. If the differential returns to the average values of those background characteristics. In other words, the difference in the extent of pressure put upon the test score explains 116.67 percent (0.434 out of the total difference of 0.372) of the mean performance difference between males and females. The endowment effect has almost no effect.

For English test scores, the difference between male and female children is 0.477 standard deviations. We see that this difference, of a total 0.477, is primarily because of the coefficient effect. The contribution of the coefficient effect is 99.58 percent of the total difference. Moreover, the coefficient effect reflects that the differential returns to the background characteristics explain 99.58 percent of the total difference. It explains the disparity in the returns to the average values of the background characteristics. In other words, the difference in the extent of pressure put upon the test score explains 99.58 percent of the mean performance difference between males and females.

Similarly, the difference is mainly due to the coefficient effect for the Social Science scores. The contribution of the coefficient effect is 90.05 percent of the total difference. It reflects that the differential returns to the background characteristics explain 90.05 percent of the total difference. In other words, the difference in the extent of pressure put upon the test score explains 90.05 percent of the mean performance difference between males and females.

On the other hand, the difference is significant for the Science test scores, but the difference between the average test score of males and females is not explained in our results.

5.6 Contribution of Factors to the Gender-Gap in Performance for Telangana

Table 5.5 represents the results of the detailed Blinder-Oaxaca decomposition for mathematics. The endowment and interaction effects are not statistically significant in our results.

Table 5.5: Detailed Blinder-Oaxaca Decomposition for Average Test Score

	Average Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to study	-0.033	0.467	-0.021	0.962	0.003	0.962
Body Mass Index	0.019	0.570	-1.879	0.061*	-0.083	0.289
Years of Education	-0.010	0.733	1.537	0.100	0.072	0.318
SC	-0.085	0.287	-0.193	0.525	0.039	0.570
OBC	0.093	0.415	-0.066	0.707	-0.016	0.731
Mother's Education	-0.012	0.776	-0.337	0.087*	0.020	0.774
Father's Education	-0.009	0.737	0.302	0.141	0.047	0.483
Expenditure on Education	-0.129	0.578	0.039	0.576	0.128	0.587
Household Size	0.006	0.787	-1.384	0.154	0.043	0.476
Assets	0.022	0.640	0.055	0.712	0.008	0.765
Type of School	0.021	0.691	0.134	0.856	-0.013	0.857
Medium of Instruction	-0.074	0.238	-0.042	0.871	0.010	0.872
Availability of Fellowship	0.000	0.966	-0.059	0.429	0.013	0.682
Mid-Day Meal	0.031	0.637	1.285	0.050*	-0.044	0.636
Total (N= 130)	-0.159	0.505	-0.485	0.021**	0.228	0.380

*Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.*

Source: Calculated using Primary Survey data, 2021.

However, the coefficient is statistically significant at a 5 percent significance level. The entirety of the coefficient effect is explained by the BMI, mother's education, and mid-day meal. The BMI, mother's education, and Mid-day meal are significant at a 10 percent significance level. We find that BMI, mother's education, and mid-day meal contribute 387.33, 69.59, and -264.75 percent of the total coefficient effect. A large part of the coefficient effect is offset by the effect of the other

factors on the outcome variable, such as years of education and mid-day meal. We find that the BMI of the students (nutrition value), mother's education, and availability of mid-day meals play a crucial role in explaining the difference in the average math test score based on gender.

Table 5.6: Detailed Blinder-Oaxaca Decomposition for Mathematics Score

	Mathematics Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to study	-0.029	0.467	-0.019	0.962	0.002	0.962
Body Mass Index	0.017	0.570	-1.681	0.061*	-0.074	0.289
Years of Education	-0.009	0.733	1.374	0.100	0.064	0.318
SC	-0.076	0.287	-0.173	0.525	0.035	0.570
OBC	0.083	0.415	-0.059	0.707	-0.014	0.731
Mother's Education	-0.010	0.776	-0.302	0.087*	0.018	0.774
Father's Education	-0.008	0.737	0.270	0.141	0.042	0.483
Expenditure on Education	-0.115	0.578	0.035	0.576	0.115	0.587
Household Size	0.005	0.787	-1.237	0.154	0.039	0.476
Assets	0.020	0.640	0.050	0.712	0.007	0.765
Type of School	0.019	0.691	0.120	0.856	-0.011	0.857
Medium of Instruction	-0.066	0.238	-0.038	0.871	0.009	0.872
Availability of Fellowship	0.0003	0.966	-0.052	0.429	0.012	0.682
Mid-Day Meal	0.027	0.637	1.149	0.050*	-0.040	0.636
Total (N= 130)	-0.142	0.505	-0.434	0.021**	0.204	0.380

*Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.*

Source: Calculated using Primary Survey data, 2021.

Similarly, Table 5.6 shows differential returns to the same average BMI based on gender. For both the BMI and mother's education, returns are more significant for the male children than female children. On the other hand, female students with mid-day meals are receiving greater returns than male students. Most of the previous literature, particularly in India, has not measured the extent to which BMI, mother's education and mid-day meal are causing the gender gap. Hence, this

inclusion in our analysis shows that these variables play a significant role in the math test score of a child.

Table 5.7: Detailed Blinder-Oaxaca Decomposition for English Score

	English Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to study	-0.073	0.223	-0.686	0.083*	0.084	0.250
Body Mass Index	0.011	0.713	-2.319	0.009***	-0.102	0.248
Years of Education	0.002	0.941	1.016	0.216	0.047	0.378
SC	-0.022	0.607	0.246	0.359	-0.050	0.458
OBC	0.023	0.551	0.247	0.124	0.060	0.455
Mother's Education	0.002	0.847	-0.072	0.674	0.004	0.810
Father's Education	0.018	0.566	0.031	0.864	0.005	0.867
Expenditure on Education	-0.117	0.581	0.044	0.495	0.144	0.514
Household Size	0.007	0.753	-0.993	0.246	0.031	0.502
Assets	0.012	0.677	0.102	0.447	0.015	0.672
Type of School	0.002	0.974	0.220	0.736	-0.021	0.742
Medium of Instruction	-0.023	0.584	0.249	0.280	-0.057	0.367
Availability of Fellowship	0.003	0.782	0.022	0.729	-0.005	0.779
Mid-Day Meal	0.022	0.644	0.701	0.225	-0.024	0.651
Total (N= 130)	-0.134	0.518	-0.475	0.012**	0.131	0.597

Note: * $p < .1$, ** $p < .05$, *** $p < .01$.

Source: Calculated using Primary Survey data, 2021.

Table 5.7 shows the factors contributing to the gender gap in English performance. It shows that the endowment and interaction effect is statistically insignificant. However, the coefficient is significant at 5 percent levels of significance. This means the gender gap is due to the difference in differential returns for the same features. Time to study and BMI are significant at 1 and 10 percent significance levels, respectively. The variable Time to study and BMI contribute to the gender gap. We find that Time to study apart from schooling hours and BMI contributes 144.42

and 488.21 percent of the total coefficient effect. A large part of the coefficient effect is offset by the negative effect of the other factors on the outcome variable, such as years of education. We find that Time spent on study apart from school and BMI is important in explaining the difference in the average English test score based on gender. We also learn that, based on gender, there are differential returns to the same variable Time to study. Similarly, based on gender, there are differential returns to the same average BMI.

Table 5.8: Detailed Blinder-Oaxaca Decomposition for Social Science Score

	Social Science Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to study	-0.029	0.495	-0.130	0.764	0.016	0.768
Body Mass Index	0.036	0.379	-2.121	0.030**	-0.093	0.268
Years of Education	0.008	0.773	0.576	0.526	0.027	0.571
SC	-0.039	0.450	0.074	0.802	-0.015	0.806
OBC	0.022	0.565	0.137	0.427	0.033	0.561
Mother's Education	0.008	0.780	0.143	0.446	-0.009	0.785
Father's Education	0.054	0.451	-0.405	0.045**	-0.064	0.458
Expenditure on Education	-0.134	0.552	0.031	0.646	0.101	0.653
Household Size	0.005	0.823	-1.214	0.199	0.038	0.488
Assets	0.030	0.627	0.037	0.801	0.006	0.822
Type of School	0.073	0.298	0.822	0.253	-0.080	0.365
Medium of Instruction	0.037	0.439	0.320	0.208	-0.073	0.318
Availability of Fellowship	0.012	0.659	0.050	0.482	-0.011	0.692
Mid-Day Meal	0.004	0.806	0.099	0.877	-0.003	0.883
Total (N= 130)	0.088	0.697	-0.362	0.087*	-0.128	0.623

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

Table 5.8 shows the factors contributing to the gender gap in Social Science performance. Results reflect that only the coefficient effect is significant at a 10 percent significance level. The entirety

of the coefficient effect is explained by the BMI and father's education level. We find it is BMI and the father's education, which plays a crucial role in explaining the difference in the average Social Science score based on gender. We also learn that there are differential returns to the same average BMI and father's education based on gender, which is greater for male children than females. BMI and father's education are significant at a 5 percent significance level, contributing 585.91 and 111.88 percent of the total coefficient effect, respectively. A large part of the coefficient effect is offset by the negative effect of the other factors on the outcome variable, such as years of education and type of school.

5.7 Micro analysis -Andhra Pradesh

The detailed data description for the Prakasham district, Andhra Pradesh, is presented in Table 5.9. The total sample size for the Prakasham district of Andhra Pradesh is 140. On average, the children's marks in Mathematics, English, Social Science, and Science are about 73, 72, 72, and 71, with a median value of around 70 for each. The range for the mathematic test score is 65 (100 – 35), with the standard deviation from the mean being about 13. Similarly, The range for the English, Social Science, and Science test score is 80 (100 – 20), 65 (100-35), and 70 (100-30), with the standard deviation from the mean, is about 14, 13, and 14, respectively.

The variable Gender shows that the study has included almost 46 percent of males and 54 percent of female students (see Table 5.9, Gender = 0.46). Similarly, dummy variables SC, ST, and OBC reflect that about 45 percent, 16 percent, and 39 percent of the children in our data set belong to SC, ST, and OBC groups, respectively. On average, Time spent on study by a child apart from the time spent in school is approximately 2 hours. The BMI of the children, on average, is about 20 kg/m². The deviation of the BMI from the mean value is 4.4 kg/m². The children's years of education is about 9 years on average. The years of education received by the children is in the 6 to 12 years range, with the standard deviation of about 2 years from the mean years of education. The average years of education of mother and father is 5 and 7 years, respectively.

The total amount spent on education by family in the last academic year on average is approximately ₹ 8,205. The range for the total expenditure on education is ₹ 95,000. The descriptive statistics for the variable type of school show that, on average, almost 71 percent of students are studying in a government school in Andhra Pradesh. Furthermore, the availability of

the fellowship for the students shows alarming results. On average, only 60 percent of students are receiving the fellowship. Lastly, on average, 76 percent of the students receive mid-day meals in the school.

Table 5.9: Descriptive Statistics for Prakasham District, Andhra Pradesh

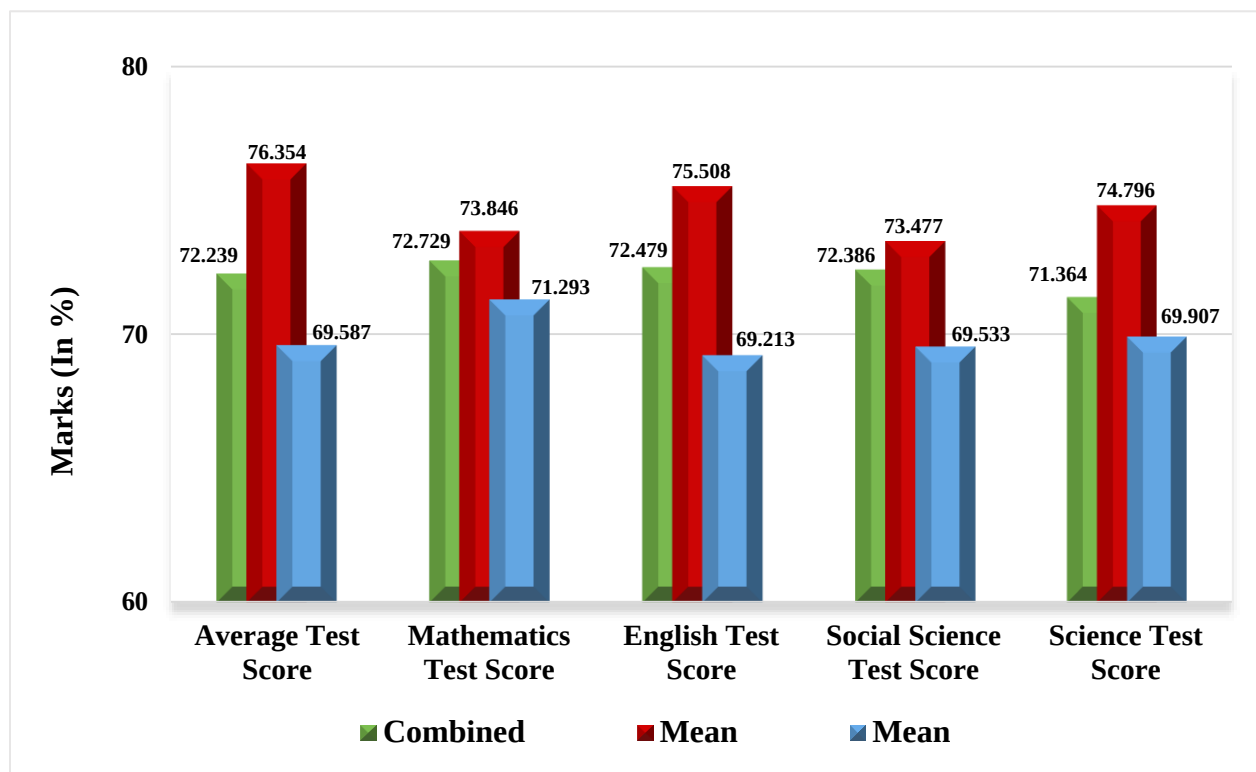
Variable	N	Mean	Median	Min	Max	Std. Dev.	Skewness	kurtosis
Average Test Score	140	72.239	72.25	32.5	100	11.715	0.114	3.341
Mathematics Test Score	140	72.729	70	35	100	12.987	0.236	2.891
English Test Score	140	72.479	70	20	100	13.986	-0.380	3.886
Social Science Test Score	140	72.386	70	35	100	13.014	0.108	2.844
Science Test Score	140	71.364	70	30	100	13.747	0.096	2.911
Gender	140	0.464	0	0	1	0.501	0.143	1.021
Time to Study	140	1.914	2	1	5	0.833	0.845	4.093
Body Mass Index	140	19.930	20.156	10.880	33.118	4.410	0.452	3.253
Year of Education	140	9.064	9	6	12	1.875	0.091	1.887
SC	140	0.45	0	0	1	0.499	0.201	1.040
ST	140	0.157	0	0	1	0.365	1.884	4.550
OBC	140	0.393	0	0	1	0.490	0.439	1.193
Mother's Education	140	5.114	5	0	15	4.525	0.425	2.152
Father's Education	140	6.957	7	0	17	5.051	-0.013	1.945
Expenditure	140	8205.007	0	0	95000	16032.18	2.353	9.380
Household Size	140	4.45	4	1	10	1.062	0.837	8.096
Assets	140	54970.71	54000	4000	414000	54164.95	3.230	17.726
Type of School	140	0.707	1	0	1	0.457	-0.910	1.829
Medium of Instruction	140	0.679	1	0	1	0.469	-0.765	1.585
Availability of Fellowship	140	0.6	1	0	1	0.492	-0.408	1.167
Mid-Day Meal	140	0.757	1	0	1	0.430	-1.199	2.438

Source: Calculated using Primary Survey data, 2021.

5.7.1 Gender-Wise Descriptive Statistics for Andhra Pradesh

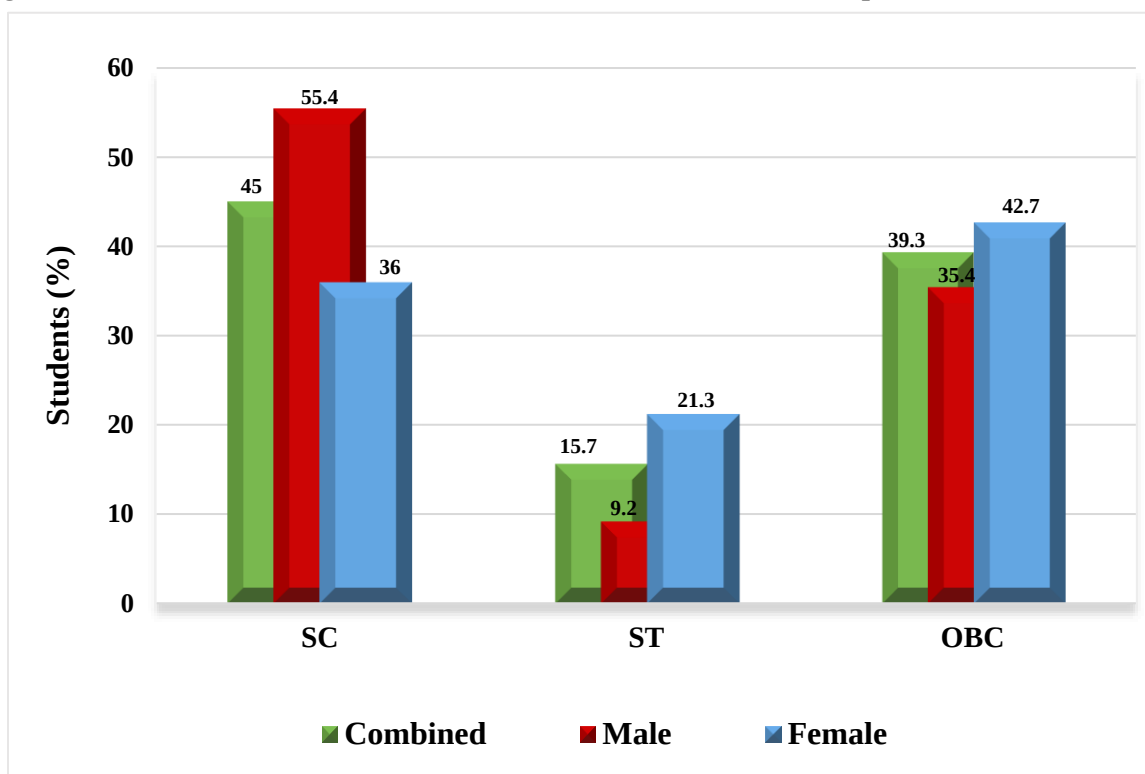
Figure 6.4 shows the mean of average marks. On average, students score 72 percent of the marks. Male students score approximately 76 percent, whereas female students score approximately 70 percent. It is reflected that male students perform much higher than female students. A similar trend is noticed for mathematics, English, Social Science, and Science, where the male students outperform female students.

Figure 5.4: Gender Wise Performance in Different Subject for Prakasham District



Source: Calculated using Primary Survey data, 2021.

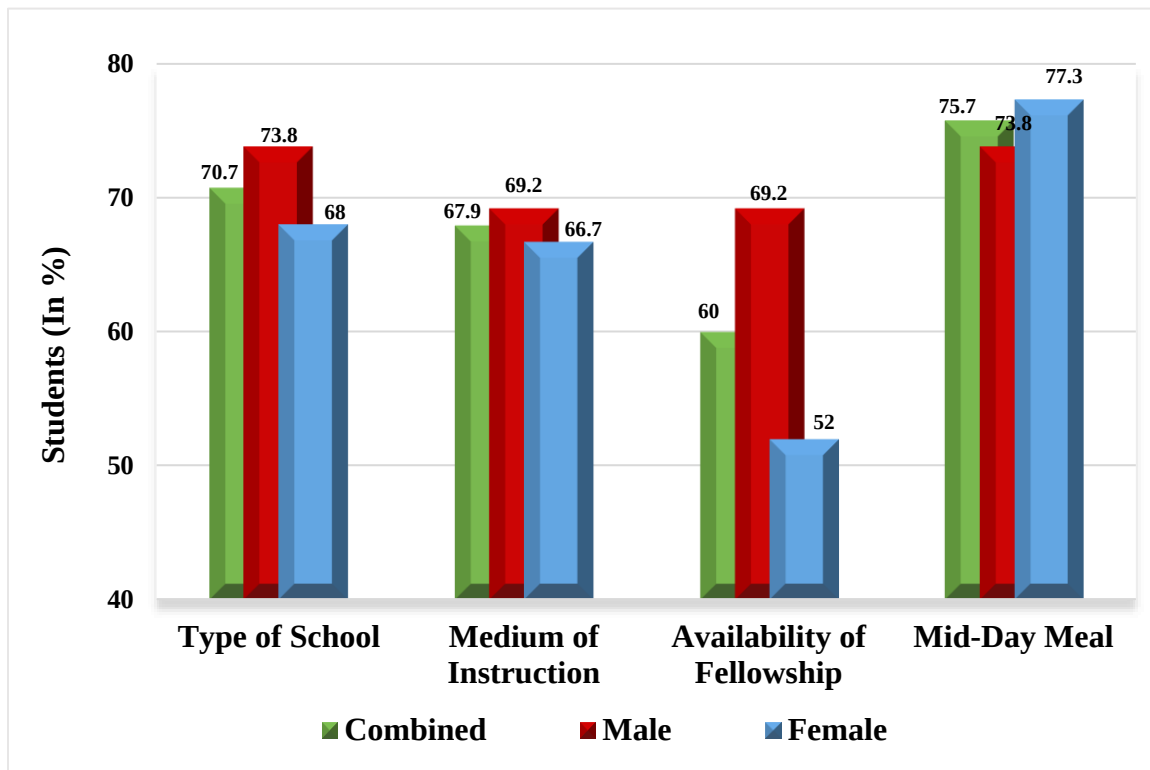
Figure 5.5: Gender-Wise Enrolled Students from different Social Groups for Prakasham District



Source: Calculated using Primary Survey data, 2021.

Figure 5.5 shows that 45 percent of students belong to SC, and about 55 percent of SC students are male, and 36 are female students in the Prakasham district, Andhra Pradesh. It means more male students from SC group is studying in school than female students. Approximately 16 percent of the students in the school belong to the scheduled tribes, and among ST students, more female students are in school than male students. Similarly, 39 percent of the students belong to the OBC background, and more OBC females are studying in school compared to the male students.

Figure 5.6: Gender-Wise percentage of Students concerning the Dummy variables for Prakasham District



Source: Calculated using Primary Survey data, 2021.

Figure 5.6 displays that almost 70 percent of the students are studying in government schools, and approximately 74 male and 68 percent female students are studying in government schools. Medium of instruction shows that about 70 percent of students are studying in English medium, and 69 percent male and 67 percent female students in English medium school. Around 60 percent of students have the availability of the fellowship. It shows the considerable gender gap in terms of availability of fellowship, where 69 percent of male students have fellowship. On the other hand, only 52 percent of female students have fellowship. For mid-day meals, around 24 percent of the total students do not have mid-day meals in our data, where 74 percent of male and 77 percent of female students have access to mid-day meals in the Prakasham district Andhra Pradesh.

5.8 Statistical Analysis of gender Based Mean Difference using T-Test for Andhra Pradesh

Table 5.10 indicates that the average value of the majority of the variables has insignificant differences based on gender. However, there are a few variables that have significant mean differences. The Mathematics, Social Science, and Science test scores have significant differences based on gender. It exhibits that the average test score for female children is less than that of male children by 6.767, 6.833, and 3.944 units, respectively and differences are statistically significant. In other words, the average mathematics test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 8.86 percent, and the difference is statistically vital. For the average English test scores, the difference is statistically insignificant. The average social science test score difference is significant at a 1 percent significance level, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 9 percent. Similarly, the average science test scores have statistically significant differences, and it shows that the average test scores for female children compared to male children are lower by almost 5 percent.

It is also reflected that the gender-based difference for time spent on study apart from school is also significant. It shows that male children spend more time studying apart from school than female students by almost half an hour. Perhaps this gap is because female students have to take care of the domestic cores compared to male students. The difference between SCs and STs among males and females is significant. The average value of assets in a household has a significant difference, and it shows that the average value of the assets for female children is less than the average expenditure on education for male children by almost 25 percent. The household size has a significant difference, and it shows that female has larger family compared to male students. The variable, Availability of fellowship, is different and statistically significant, and almost 17 percent more male children have availability of fellowship than female children.

Table 5.10: Gender-Based Means of Explanatory Variables for Andhra Pradesh

Variables	Overall	Male	Female	Difference
Average Test Score	72.239 (11.715)	74.931 (12.600)	69.907 (10.422)	5.024***
Mathematics Test Score	72.729 (12.987)	76.354 (13.562)	69.587 (11.671)	6.767***
English Test Score	72.479 (13.986)	73.846 (14.134)	71.293 (13.843)	2.553
Social Science Test Score	72.386 (13.014)	76.046 (13.913)	69.213 (11.347)	6.833***
Science Test Score	71.364 (13.747)	73.477 (15.374)	69.533 (11.969)	3.944**
Time to study	1.914 (0.833)	2.215 (0.696)	1.653 (0.858)	0.562***
Body Mass Index	19.930 (4.410)	20.121 (4.336)	19.764 (4.496)	0.358
Years of Education	9.064 (1.875)	9.108 (1.804)	9.027 (1.945)	0.081
SC	0.45 (0.499)	0.554 (0.501)	0.36 (0.483)	0.194**
ST	0.157 (0.365)	0.092 (0.292)	0.213 (0.412)	-0.121**
OBC	0.393 (0.490)	0.354 (0.482)	0.427 (0.498)	-0.073
Mother's Education	5.114 (4.525)	5.4 (4.889)	4.867 (4.202)	0.533
Father's Education	6.957 (5.051)	7.477 (5.115)	6.507 (4.985)	0.970
Expenditure	8205.007 (16032.18)	8344.631 (16279.47)	8084.000 (15923.62)	260.631
Household Size	4.45 (1.062)	4.292 (1.208)	4.587 (0.902)	-0.294*
Assets	54970.71 (54164.95)	63547.69 (65484.4)	47537.33 (41006.41)	16010.36**
Type of School	0.707 (0.457)	0.738 (0.443)	0.68 (0.470)	0.058
Medium of Instruction	0.679 (0.469)	0.692 (0.465)	0.667 (0.475)	0.026
Availability of Fellowship	0.6 (0.492)	0.692 (0.465)	0.52 (0.503)	0.172**
Mid-Day Meal	0.757 (0.430)	0.738 (0.443)	0.773 (0.421)	-0.035

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

5.9 Factors Causing Gender Gap in Performance

Table 5.11 displays that the difference between male and female students for mathematics test scores is 0.521. We see that this difference is primarily and only because of the coefficient effect (significant at 5 percent level of significance). The contribution of this effect is 91.75 percent of the total difference. Similarly, the Social Science score difference between male and female students is 0.525. The difference is mainly because of the coefficient effect (0.412 standard deviations). The coefficient effect contributes almost 78.48 percent of the total difference. On the other hand, the gender based difference in English and Science performance between male and female children is insignificant in our results.

The decomposition result reports the mean predictions by groups and their difference in the first section. In our analysis, the mean Mathematics score is 5.878 for males and 5.357 for female children, yielding a performance gap of 0.521. Similarly, the mean Social Science score is 5.843 for males and 4.318 for female children, yielding a performance gap of 0.525.

For the Mathematics test scores, even though we have found that the average values of the variables are significantly different (Table 5.11) and better for male children, this difference does not explain the difference in the average scores between them. It explains the difference in the average returns to the average values of those background characteristics. In other words, the difference in the extent of pressure put upon the test score explains 91.75 percent of the mean performance difference between males and females. The endowment effects (i.e. the difference between the two groups in the mean values of the child) is statistically insignificant. Similarly, the difference is also mainly due to the coefficient effect for the Social Science scores. The contribution of the coefficient effect is 78.48 percent of the total difference. It reflects that the differential returns to the background characteristics explain 78.48 percent of the total difference. In other words, the difference in the extent of pressure put upon the test score explains 78.48 percent of the mean performance difference between males and females.

Table 5.11: Blinder-Oaxaca Decomposition Results for Mathematics, English, Social Science, and Science Score

	Overall Average Score		Mathematics Score		English Score		Social Science Score		Science Score	
	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value
Male	6.393	0.000	5.878	0.000	5.278	0.000	5.843	0.000	5.344	0.000
Female	5.965	0.000	5.357	0.000	5.096	0.000	4.318	0.000	5.057	0.000
Difference	-0.429	0.017**	-0.521	0.003*	-0.182	0.317	-0.525	0.003*	-0.287	0.122
Endowment Effect $\{E(P_M) - E(P_F)\}'\beta_M$	-0.246	0.207	-0.276	0.145	-0.190	0.292	-0.242	0.211	-0.154	0.448
Coefficient Effect $E(P_M)'(\beta_M - \beta_F)$	-0.316	0.114	-0.478	0.016**	-0.185	0.392	-0.412	0.045**	-0.049	0.817
Interaction Effect $\{E(P_M) - E(P_F)\}'(\beta_M - \beta_F)$	0.133	0.556	0.233	0.295	0.192	0.414	0.129	0.569	-0.083	0.726

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

[#] Standardised Test Score

5.10 Factors Contributing to the Gender-Gap in performance

Table 5.12 represents the results of the detailed Blinder-Oaxaca decomposition for mathematics.

Table 5.12: Detailed Blinder-Oaxaca Decomposition for Mathematics Score

	Mathematics Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to study	-0.282	0.020	-1.491	0.002***	0.378	0.013
Body Mass Index	0.009	0.673	0.161	0.823	-0.003	0.840
Years of Education	-0.005	0.807	0.452	0.580	-0.004	0.816
SC	-0.059	0.514	0.172	0.558	-0.060	0.570
OBC	0.054	0.443	-0.234	0.252	-0.048	0.483
Mother's Education	-0.005	0.781	0.220	0.324	-0.022	0.572
Father's Education	-0.052	0.333	-0.428	0.117	0.056	0.357
Expenditure on Education	0.002	0.925	-0.091	0.565	0.003	0.925
Household Size	-0.051	0.235	-0.064	0.924	-0.004	0.924
Assets	0.080	0.146	0.245	0.227	-0.062	0.321
Type of School	0.038	0.520	0.470	0.313	-0.037	0.544
Medium of Instruction	-0.005	0.768	0.103	0.667	-0.004	0.796
Availability of Fellowship	-0.027	0.559	-0.366	0.109	0.091	0.200
Mid-Day Meal	0.027	0.653	-1.076	0.061*	-0.051	0.645
Total (N= 130)	-0.276	0.145	-0.478	0.016**	0.233	0.295

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

However, the coefficient is significant at a 5 percent level of significance. The entirety of the coefficient effect is explained by the variable Time to study and mid-day meal. The Time to study and mid-day meals are significant at 1 and 10 percent significance levels, respectively. We find that the Time to study and mid-day meal contribute 311.92 and 225.10 percent of the total coefficient effect. A large part of the coefficient effect is offset by the effect of the other factors on the outcome variable, such as years of education and the type of school. We find that Time

spent on study apart from the schooling hours and the availability of mid-day meals play a crucial role in explaining the difference in the average mathematics test score based on gender.

Similarly, there are differential returns to the same average Time spent on study apart from school based on gender. For both the Time to study and availability of mid-day meals, returns are greater for the male children than female children. On the other hand, female students with the availability of mid-day meals are receiving greater returns than male students.

Table 5.13: Detailed Blinder-Oaxaca Decomposition for Social Science Score

	Social Science Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Time to study	-0.183	0.104	-1.012	0.044**	0.257	0.068
Body Mass Index	-0.009	0.677	-1.624	0.028**	0.029	0.640
Years of Education	-0.006	0.803	-0.008	0.992	0.000	0.992
SC	0.010	0.906	0.336	0.268	-0.118	0.314
OBC	-0.005	0.880	0.141	0.494	0.029	0.588
Mother's Education	0.0004	0.978	0.214	0.348	-0.021	0.579
Father's Education	-0.067	0.308	-0.444	0.113	0.058	0.355
Expenditure on Education	-0.004	0.924	-0.208	0.215	0.006	0.924
Household Size	-0.064	0.197	0.780	0.259	0.053	0.355
Assets	0.003	0.931	0.048	0.813	-0.012	0.815
Type of School	0.077	0.470	1.141	0.018**	-0.090	0.470
Medium of Instruction	-0.004	0.782	0.089	0.716	0.003	0.809
Availability of Fellowship	-0.036	0.458	-0.055	0.812	0.014	0.813
Mid-Day Meal	0.047	0.641	-1.529	0.010**	-0.072	0.640
Total (N= 130)	-0.242	0.211	-0.412	0.045**	0.129	0.569

Note: * $p < .1$, ** $p < .05$, *** $p < .01$ and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

However, the coefficient effect is significant at a 5 percent significance level. In coefficient effect, the variable time to study, BMI, type of school, and mid-day meal is significant at 5 percent level of significance. The entirety of the coefficient effect is explained by the time to study, BMI, SC, type of school, and mid-day meal. We find it is just the Time spent on study apart from schooling hours, BMI (health of the children), SC (social background), type of school, and availability of mid-day meal, which plays a crucial role in explaining the difference in the average Social Science score based on gender. We find the Time to study, BMI, Type of school, and mid-day meal contribute 245.63, 394.17, -276.94, and 371.12 percent of the total coefficient effect, respectively. We also find that there are differential returns to the same average Time spent on study, BMI, and availability of mid-day meals based on gender, where it is greater for the male children than the females, where it is higher for females than male students. Most of the previous literature has neither discussed nor included the time to study, BMI, type of school, and mid-day meal variable. This inclusion in our analysis shows a crucial role in the Social Science performance of a child.

5.11 Conclusion

The study has used the primary data collected through fieldwork. The study attempted to explain the large and persistent educational performance gap among marginalised groups between males and females in Mancherla and Prakasham district of Telangana and Andhra Pradesh, respectively. The study also analysed the attributes that explain the performance gap between genders. The overall performance for male students is high compared to the female students. The same trend is observed for mathematics, English, Social Science, and Science performance.

Further, the non-parametric approach (t-test) study found significant gender-based mean differences for the variables. We found a significant mean difference in the overall performance of male and female students, where male students outperformed female students for Telangana State and Andhra Pradesh. Similar results are found for the Mathematics, English, Social Science, and Science performance. The study analysed that the gender-based mean difference is more for Telangana than Andhra Pradesh concerning overall performances. Using the threefold Blinder-Oaxaca decomposition for overall performance and performance in Mathematics, English, Social Science, and Science for both Telangana and Andhra Pradesh separately, we found that majority of the difference between them is due to the differential returns to the background characteristics.

For the Telangana, the BMI, mother's education level, and mid-day meal contribute significantly to the overall performance and Mathematics performance. Additionally, it is time spent studying by a child apart from school hours and BMI for the English performance. For Social Science, BMI and father's education contribute significantly to the performance gap between the genders.

On the same line, for Andhra Pradesh, the difference is also explained by the coefficient effect for Mathematics and Social Science. For performance in English and Science, the difference is insignificant, and for the overall performance, the educational performance gap is not explained by the features. For the Mathematics performance, variables Time spent on study apart from school hours and mid-day meal contribute to the performance gap whereas for Social Science, Time spent on study, BMI, Type of school, and Mid-day meal significantly contribute to the performance gap between the male and female students.

CHAPTER-VI

Gender Gap and Access to Education a Regional Perspective

“Women, like men, must be educated with a view to action, or their studies cannot be called education.”

-Harriet Martineau

Abstract

The National Achievement Survey (NAS-2014) depicts a critical contrast across states in the average level of students' performance. The report also found that the gender gap is noticeable in united Andhra Pradesh with regard to educational achievement. The preliminary findings from the Young Lives Survey for Round 5 (2017) indicate that gender is a significant factor in children's academic achievement, where boys are scoring better grades than girls. This chapter analyses the educational performance gap based on regional factors Andhra Pradesh and Telangana. What factors cause a gender gap, and to what extent do these factors contribute to educational performance gaps? The chapter also brief the educational status of the state's policies. The study adopted the Oaxaca-Blinder decomposition technique. On average, male students' overall performance is high compared to female students. The same trend is visible for Mathematics, English, Social Science, and Science performance. The study also noticed that region significantly influences female students' overall performance and performance in individual subjects. Using the threefold Blinder-Oaxaca decomposition, we found that majority of the difference between them is due to coefficient effect or the differential returns to the background characteristics. It is the regional location of the student, time spent on study apart from school hours, and BMI which contribute significantly to the overall average performance. For Mathematics, it is time spent on study, and for the English performance, it is the region, time to study or time spent on study by a child apart from school hours, and BMI that significantly contributes to the gender gap in educational performance. However, for Social Science, it is time to study, BMI, Father's education, and type of school, and for Science, the BMI, father's education, and type of school plays a significant role in the gender gap.

6.1 Introduction

The motive of the chapter is to gauge the influence of the regional location of the student on the educational performance and measure the percentage of the contribution to the gender gap. The chapter also measures the gender gap in educational performance among marginalised groups for the sample collected from Telangana and Andhra Pradesh. The chapter assesses the relationship between each variable and subject using the Chi-Square method. It also analysed the influence of variables on performance for using simple regression analysis. Contribution of the variables to the gender gap is measured by using B-O decomposition. The chapter also attempts to answer whether there is any gender gap due to regional differences among the children. The primary survey was conducted in 16 villages of 4 mandals of two districts, Mancherial and Prakasham. The study aimed to collect information from the students belonging to the scheduled caste, scheduled tribe, and other backward communities. The Constitution of India states that free and compulsory education must be provided to all children up to age 14. What is notable is the considerable progress in schooling participation.

Education strengthens democracy by providing citizens with the tools required to participate in the governance process. Educational performance depends on many factors that can be classified into three characteristics: child-specific features, including gender of the child, time spent on study by child, nutrition level of the child (BMI), social background, and availability of the fellowship. Parental education includes the education level achieved by the mother and father of the child. Household factors include household size, availability of the computer, expenditure on education, household assets.

United Andhra Pradesh was the fourth largest state in India in terms of area with a population of around 84 million in 2011, of which male and female were equal with 42 million each (Census, 2011). The National Achievement Survey (NAS-2014) depicts a critical contrast across states in the average level of students' performance. The report also found that the gender gap is noticeable in Andhra Pradesh with regard to educational achievement. The preliminary findings from the Young Lives Survey for Round 5 (2017) says that “gender is a significant factor in children's academic achievement,” where boys are scoring better grades than girls. Studies using the Young Lives data have shown the impact of gender on educational performance. A study of four developing countries (India, Ethiopia, Vietnam and Peru) shows that the gender gap is less at the

primary level (8 years), and it increases later between the ages of 12 to 15 years (Singh and Krutikova, 2017). The gap is favourable for boys in India, Ethiopia, and Peru. Similarly, in other developing countries, gender influences educational performance. A study (Dickerson et al., 2015) using data from 19 African countries found a significant difference in Mathematics scores where boys outperformed their counterparts. The Young Lives report (2017) for India also found differences between the educational performances of boys and girls.

6.2 Gender and Education

Table 6.1 presents childhood characteristics, parental education, household characteristics, and other features. It shows that participation in the survey from male and female students are almost equal. Almost 52 percent of the sample are collected from Andhra Pradesh and 48 percent from Telangana. The social group-wise estimates show that most students belong to Scheduled Caste. Almost 47 percent are from SC, 17 percent are from ST, and 36 percent are from OBC background.

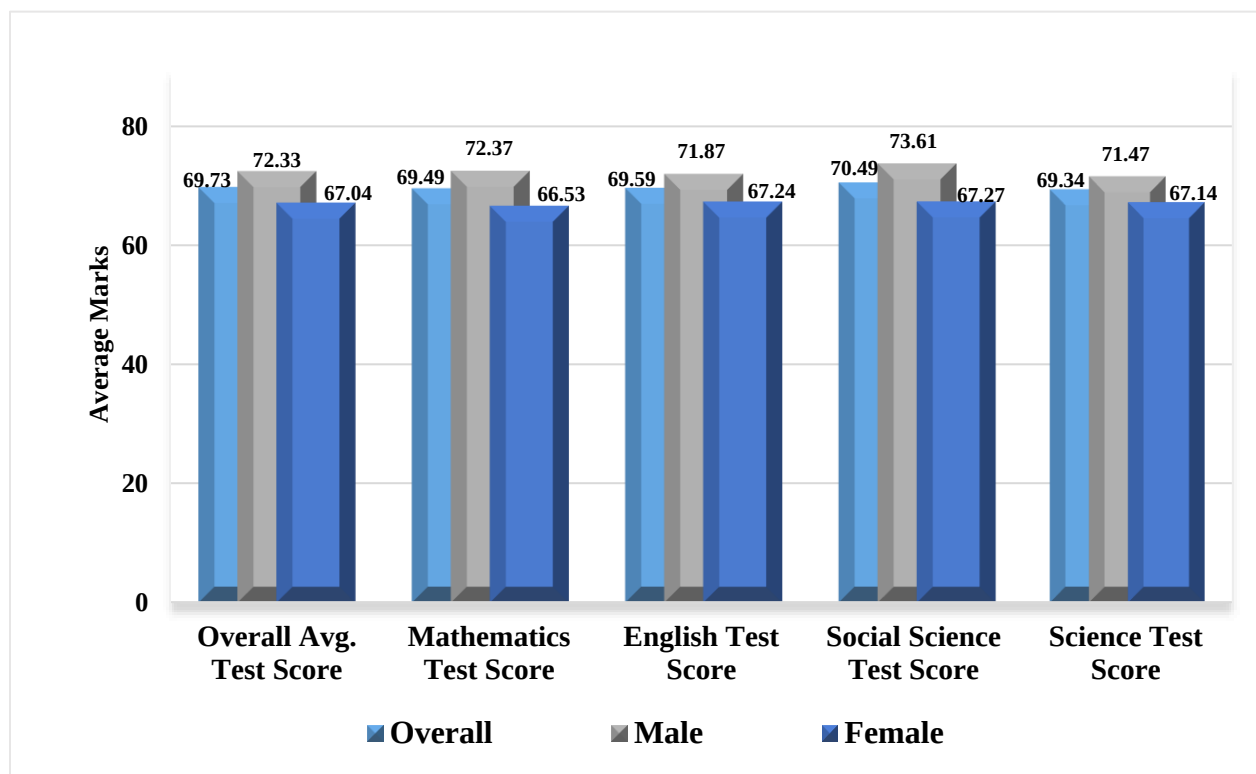
Table 6.1: Descriptive Statistics for Mancherial and Prakasham District

Variable	N	Mean	Median	Min.	Max.	Std. Dev.	Skewness	kurtosis
Overall Avg. Test Score	270	69.731	69.875	32.5	100	13.566	0.042	2.845
Mathematics Test Score	270	69.496	70	30	100	15.214	0.059	2.608
English Test Score	270	69.593	70	20	100	15.756	-0.154	2.749
Social Science Test Score	270	70.493	70	35	100	14.904	0.034	2.664
Science Test Score	270	69.341	70	30	100	15.655	0.025	2.571
Gender	270	0.507	1	0	1	0.501	-0.030	1.001
Region	270	0.519	1	0	1	0.501	-0.074	1.005
Time to Study	270	1.887	2	0	5	0.863	0.538	2.919
Body Mass Index	270	19.364	19.012	10.880	33.118	4.085	0.580	3.271
Year of Education	270	9.096	9	6	12	1.889	-0.063	1.852
SC	270	0.470	0	0	1	0.500	0.119	1.014
ST	270	0.170	0	0	1	0.377	1.754	4.075
OBC	270	0.359	0	0	1	0.481	0.587	1.344
Mother's Education	270	4.311	3.5	0	15	4.412	0.629	2.230
Father's Education	270	5.719	5	0	17	4.975	0.316	1.911
Expenditure	270	6828.411	0	0	172000	18410.18	4.693	33.066
Household Size	270	4.470	4	1	10	1.019	0.904	6.564
Assets	270	65505.93	52750	3500	649000	90888.89	4.249	23.775
Type of School	270	0.789	1	0	1	0.409	-1.416	3.004
Medium of Instruction	270	0.622	1	0	1	0.486	-0.504	1.254
Availability of Fellowship	270	0.359	0	0	1	0.481	0.587	1.344
Mid-Day Meal	270	0.807	1	0	1	0.395	-1.559	3.431

Source: Calculated using Primary Survey data, 2021.

Figure 6.1 reflects that, on average, the average marks scored by male students are higher than the average marks scored by female students. Female are performing lower than the combined average marks. For the Mathematics test, female students' average marks are lower than the combined marks and even lower than the average of male students marks. The study also finds a similar gap in average marks scored by students in Social Science and Science, where female students average score is lower than male students average score in the respective subjects.

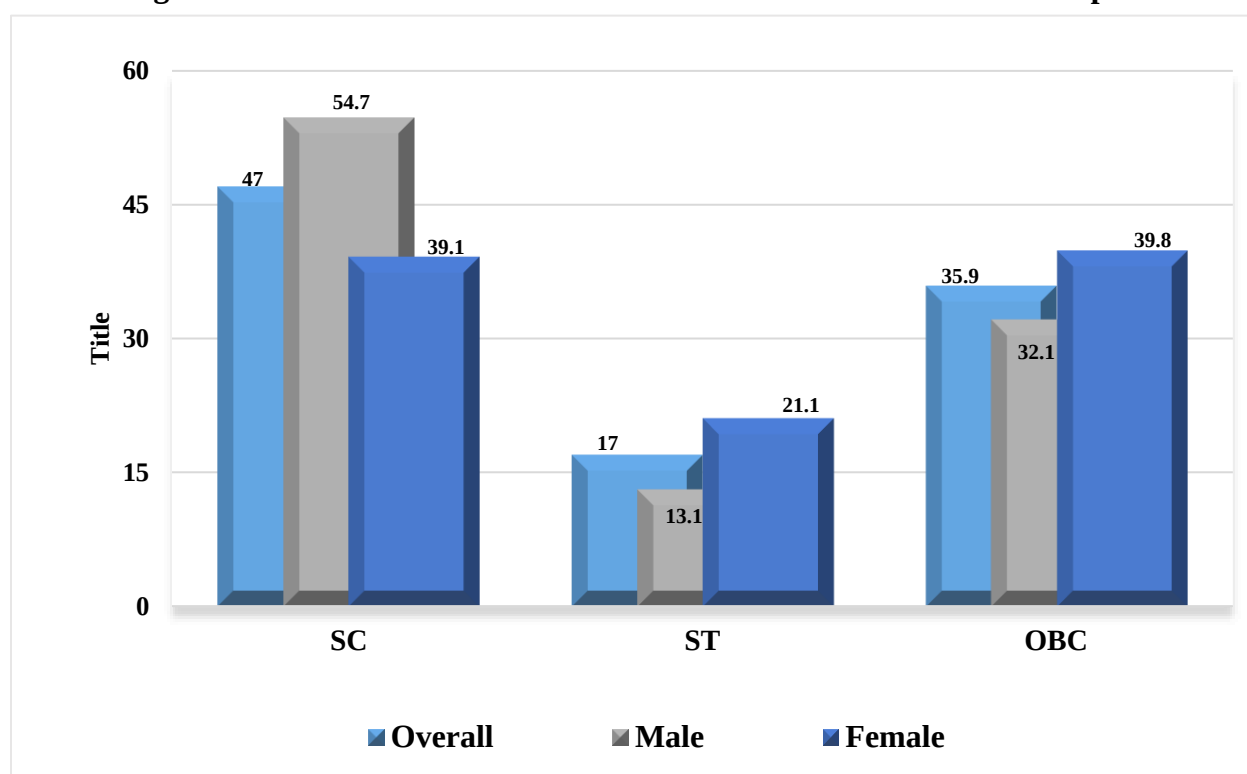
Figure 6.1: Gender-Wise Performance in Different Subject



Source: Calculated using Primary Survey data, 2021.

Figure 6.2 displays the percentage of the students enrolled in school from different social backgrounds in Mancherial and Prakasham. The sample covered almost 47 percent of students from Scheduled Caste, out of which approximately 55 percent are male, and 39 percent are female students. The study also covered 17 percent of students from Scheduled Tribes, of which almost 13 percent are male, and 21 percent are female students. Almost 36 percent of the total sample belongs to the other backwards castes. Out of this, approximately 32 percent are male, and 40 percent are female students.

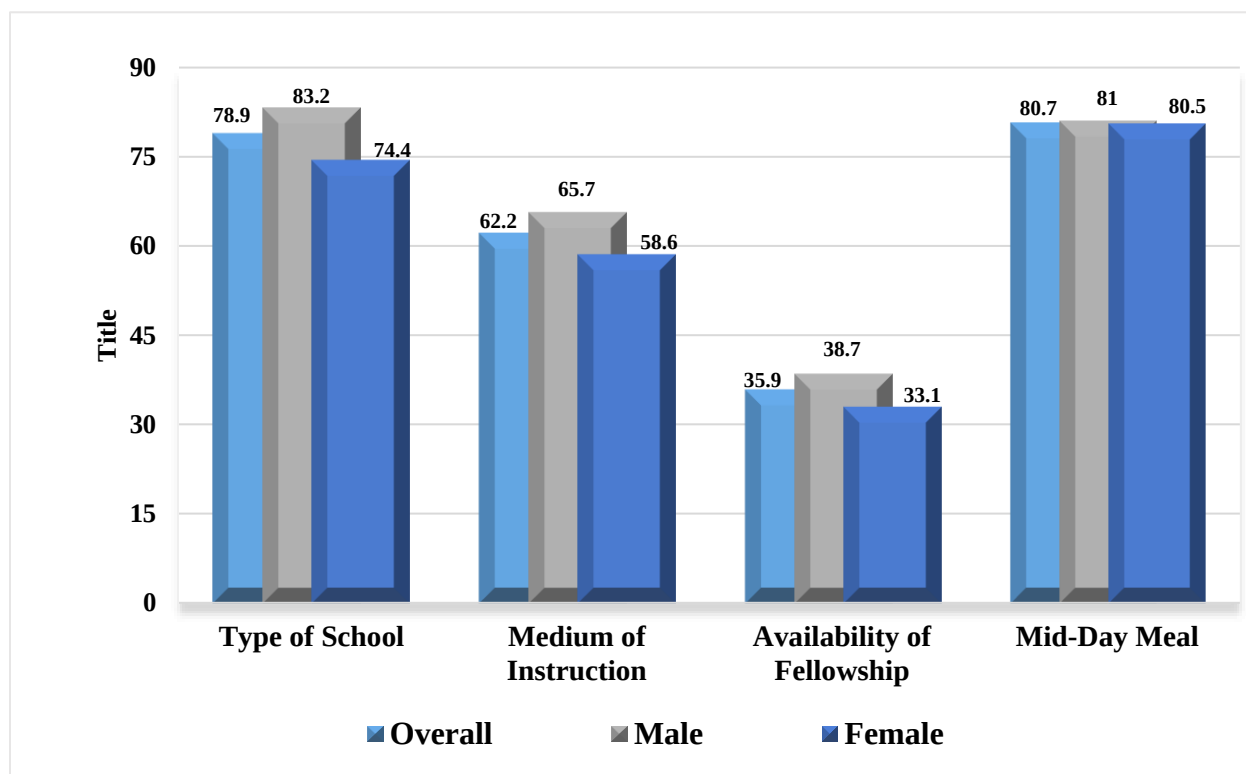
Figure 6.2: Gender-Wise Enrolled Students from different Social Groups



Source: Calculated using Primary Survey data, 2021.

Figure 6.3 reflects that, on average, almost 79 percent of the students in our sample are studying in government schools, about 83 percent of the males are in government schools, whereas 74 percent of the female are in government schools. It shows that more male students study in English medium schools than female students. Overall only 36 percent of the students have availability of the fellowship, only 39 percent of the male and just 33 percent of the female have fellowship. About 81 percent of the students have access to mid-day meals, 81 percent of males and 80 percent of the females are getting mid-day meals in Mancherial and Prakasham districts Telangana and Andhra Pradesh, respectively.

Figure 6.3: Gender-Wise percentage of Students concerning the Dummy variables



Source: Calculated using Primary Survey data, 2021.

6.3 Educational Status and Various Policies of the State

Telangana

The government provides preschool education through *anganwadi* centers to the children of age 3-6 years. In 2018, the state had literacy rate of 72.8 percent and the government aims to achieve universal literacy in the state. The government has also introduced several schemes to ensure access to education. Telangana has focused on school infrastructure, building residential schools and providing financial aid in scholarships to the students of marginalized communities. The total number of schools in the state is 40,900, of which 63.7 percent are government and local body schools¹⁷. On the other hand, 25.7 percent are private schools and 8.4 percent are the welfare, residential and other state government schools. In addition, 1.64 percent are private-aided schools and less than one percent are run by central government (Government of Telangana, 2021). Almost 38 percent of the government schools in the state have less than 30 students. The total enrollment for the state for the year of 2019-20 was 60.1 lakh, with 48.7 percent girl students. 46.1 percent of the total enrolled students are in government schools and 53.9 percent are in private schools. More girl students are enrolled in the government schools compared to the boy students for both the age groups i.e., 50.5 percent girls and 45.8 percent boys for the age group of 7-10 years and 67 percent girls and 58.2 percent boys for the age group of 11-16 years (ASER, 2020). The overall literacy rate is 66.54 percent and 75.04 percent for male and 57.99 percent for female.

As per the Planning Department, Government of Telangana (2021), 49 percent students belongs to the backward classes (BC), 23.2 percent to the general category, 16.9 percent to the Scheduled Caste (SC), and 10.9 percent belongs to the Scheduled Tribes (ST). The government has taken several initiatives for the students belonging to marginalized communities such as:

- (i) **Post-Matric and Pre-Matric scholarships:** To encourage students from marginalized communities to study, other government provides financial assistance and reimburse the tuition fee.
- (ii) **Assistance for overseas education:** The government also provides financial aid to the marginalized and minority communities to pursue higher education abroad.

¹⁷ This includes zilla parishad high schools and mandal parishad primary school run by district and mandal level authorities.

- (iii) **Residential Schools:** After the formation of the state, the number of residential institutions has increased more than four-fold (from 298 in 2014-2015 to 923 in 2020-21), it is a crucial step to achieve universal access to education in the state. Type of Residential Schools:-
- (a) Telangana Residential Educational Institution Society (TRIES)
 - (b) Telangana Social Welfare Residential Educational Institutions Society (TSWREIS)
 - (c) Telangana Tribal Welfare Residential Educational Institutions Society (TTWREIS)
 - (d) Telangana Minority Residential Educational Institutions Society (TMREIS)
 - (e) Mahatma Jyotiba Phule Telangana Backward Classes Welfare Residential Educational Institutions Society (MJPTBCWREIS)
- (iv) **Other Social Groups:** The Department of School Education also runs the special schools, for the blocks with the poor female literacy rate, named Kasturba Gandhi Balika Vidyalayas (KGBV). These are residential school to provide quality of education to the female students. Apart from this, for the persons with disabilities, the state has opened 5 residential schools (2 schools for visually impaired and 3 for hearing impaired). These schools have total 830 students and 25 teachers.

Andhra Pradesh

The literacy rate for Andhra Pradesh is 67.35 percent with 74.77 and 59.96 for males and females respectively. The literacy rate for rural Andhra Pradesh is 62.37 percent and for urban area it is 79.71 percent (Census, 2011). In both the areas, female literacy rate is lower than the male literacy rate. Andhra Pradesh has total of 61528 schools. MPP/ZPP runs 38719 schools, 5872 are run by state government, 14605 are private unaided schools, and 63 are handled by the government of India (Government of Andhra Pradesh, 2021). Andhra Pradesh has achieved 99% access at elementary level and 91.5% at secondary level (Government of Andhra Pradesh, 2021). The government has taken several steps for ensuring 100 percent access to education. Government has initiated many schemes for universalization of elementary education such as:

- (i) **Jagananna Ammavodi:** Under this scheme 44.48 lakh mothers belongs the BPL are identified as eligible and transferred the amount of ₹15000/-.
- (ii) **Strengthening the existing schools:** Out of 15000 of Jagananna Ammavodi scheme 1000 will be apportioned towards School toilets maintenance fund (STMF).

- (iii) **Jagananna Vidya Kanuka:** The government has given students kits consisting of three pairs of uniforms, a set of notebooks, test books, a pair of shoes and two pairs of socks, a belt and a school bag to all the students except private school.
- (iv) **Mana Badi Nadu-Nedu (MBNN):**
- (v) **Kasturba Gandhi Balika Vidyalaya (KGBVS):** 131 KGBVs schools for VI to X and 221 for VI to XII are functioning in the state.
- (vi) **Other key initiatives:** Recently, the government has taken new initiatives such as T.V. lessons and radio lessons, YouTube channel and Facebook page for SCERT, Webinar based ICT training, Webinar and Abhyasa app-based English training, Bridge course to primary students through TV, toll-free cell center to students for clearing their doubts, learning enhancement program, language festivals, teachers' performance indicator, mother tongue-based multilingual education, strengthening the libraries, annual grants, in-service teacher training, We love reading campaigning, inclusive education, and therapeutic services for the CWSN (children with special need).

The government has taken several steps to ensure 100 percent access to education and achieve universalization of elementary education. The gross enrollment ratio during 2016-17 in I-V class was 82.79, for class VI-VIII was 80.87 and in IX-X class was 76.08, whereas the dropout rate in I-V class was 2.15, for class I-VIII was 1.55 and in I_X class was 1.29 (Government of Andhra Pradesh, 2021). Dropout rate was more for the SC and ST students than the overall dropout rate for the state (Government of Andhra Pradesh, 2021).

The state government has 1252 hostels for scheduled caste students during 2016-17 (Government of Andhra Pradesh, 2021). State also has 897 welfare hostels for pre matric and 356 for post metric students (Government of Andhra Pradesh, 2021).

6.4 The Relationship between Educational Performance and Variables

Table 6.2 presents a correlation between the variables such as childhood characteristics, parental education, household features, and other features and aspects of educational performance.

Table 6.2: The Association between Educational Performance and Variables

Variable	Overall Test average Score	Mathematics Test Score	English Test Score	Social Science Test Score	Science Test Score
Region	19.062***	19.466***	21.952***	7.706**	9.025**
Gender	14.633***	16.121***	5.084	16.766***	7.066*
Time to Study	22.984*	27.188**	18.501	22.711**	24.904*
Body Mass Index	11.079	7.200	13.268	3.107	6.686
Year of Education	26.324*	17.437	14.070	20.398*	29.106**
Category	15.404**	15.824**	8.695	8.328*	14.274**
Mother's Education	5.879	20.008**	11.894	11.612*	9.650
Father's Education	13.984	23.966**	24.623**	13.088	7.393
Expenditure	20.905**	21.242**	14.350	22.111***	15.300*
Household Size	21.643	31.676*	15.452	22.485*	23.805
Assets	6.310	9.278	13.593	3.562	9.086
Type of School	11.176**	6.604*	11.698***	13.915***	6.788*
Medium of Instruction	12.537***	14.644***	10.947**	4.667*	4.622
Availability of Fellowship	8.016**	5.343	10.828**	8.639**	4.514
Mid-Day Meal	16.906***	15.945***	9.113**	14.375***	10.370**

Note: χ^2 denotes Pearson chi square test. Statistical significance level (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$)

Source: Calculated using Primary Survey data, 2021.

However, the Pearson correlation coefficient shows that BMI, parental education, household size and assets have no significant relation with the overall test score of the student. It also reflects that overall test score is significantly associated with the region, gender, time to study, years of education, social background, expenditure on education, type of school, medium of instruction, availability of fellowship, and mid-day meal.

6.5 Determinants of Educational Performance

The results of the regression analysis, for average test score, are summarised in Table 6.3, where it is observed (first two columns of Table 6.3) that the variables Gender, Region, Time to study, Body Mass Index, Years of Education, social background (SC and OBC), Father's Education, Household Size, Assets, and Medium of Instruction have significant effects on the overall average test score. The variables Gender, Region, and Household size are significant at a 1 percent

significance level. Years of education, Social background, Assets are significant at a 5 percent significance level. Body mass index and Father's education are significant at a 10 percent significance level. In line with the previous literature (Douglas B. Downey, 1994; Attavel and Battle, 2006; Teachman, 1987; Balatchander, 2013; Arteaga and Glewwe, 2014; Collins and et al., 2000; Hooda, 2017; Okyere, 2019; Saleh and Rahman, 2016; Chinyoka and Naidu, 2014; Nagi and Sridevi, 2020) where it is shown that gender influences educational performance. We also find in our analyses that there is a difference in the overall average performance of males and females where the results show that female educational performance is lower than male children. Results portray that *ceteris paribus*, the average test score for females compared to males, is lower by about 5.077 units. Thus, the female children's overall performance is lower than male children's.

Similar results are visible where the variables Gender, Region, Time to study, Body Mass Index, Years of Education, Social background (SC and OBC), Father's Education, Household Size, Assets, and Medium of Instruction have significant effects on the Mathematics test score (see Appendix Table A6.1). The results of the regression analysis for English test shows that the variables Gender, Region, Time to study, Body Mass Index, Years of Education, social background (SC and OBC), Expenditure on female education, Household Size, Assets, and Medium of Instruction have significant effects on the English test score (see Appendix Table A6.2). For Social Science test it is observed that the variables Gender, Region for female students, Body Mass Index for female students, Years of Education, social background (SC and OBC), Father's Education, Household Size, Assets, type of school, and Mid-Day meal for male students have significant effects on the Social Science test score (see Appendix Table A6.3). The results of the regression analysis for Science test score shows that the variables Gender, Region, Body Mass Index for female students, Years of Education, social background (SC and OBC), Household Size, Assets, and type of school for male students have significant effects on the Science test score (see Appendix Table A6.4).

Table 6.3: The Regression Results for Average Test Score

Variables	Average Test Score					
	For the whole Sample		For male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	5.077	0.002***	-	-	-	-
Region	-4.984	0.007***	-0.359	0.906	-8.651	0.001***
Time to Study	0.477	0.655	3.679	0.020**	-1.740	0.181
Body Mass Index	-0.328	0.064*	0.051	0.837	-0.709	0.007***
Year of Education	1.025	0.026**	0.817	0.212	1.344	0.036**
SC	5.144	0.017**	4.310	0.223	7.305	0.012**
OBC	5.632	0.013**	4.964	0.155	8.378	0.010**
Mother's Education	0.104	0.611	0.001	0.998	0.039	0.889
Father's Education	0.326	0.075*	0.552	0.065*	0.110	0.624
Expenditure	2.49e-06	0.958	0.000	0.934	0.000	0.749
Household Size	-2.500	0.001***	-2.354	0.011**	-2.701	0.022**
Assets	0.000	0.040**	7.61e-06	0.665	0.000	0.004***
Type of School	-3.008	0.202	-5.691	0.117	2.037	0.427
Medium of Instruction	2.440	0.118	-0.334	0.886	4.149	0.068*
Availability of Fellowship	-1.150	0.520	-0.757	0.803	-0.965	0.644
Mid-Day Meal	-0.264	0.920	-0.305	0.935	-1.503	0.641
Constant	75.221	0.000	65.124	0.000	84.224	0.000
Number of obs.	270		137		133	
F	5.95 (16,253)		3.84 (15, 121)		4.55 (15,117)	
Prob.>F	0.000		0.000		0.0000	
R-squared	0.2635		0.2734		0.3396	
Root MSE	12.005		12.315		11.237	

Note: *p<.1, **p<.05, ***p<.01.

Source: Calculated using Primary Survey data, 2021.

We checked for homoskedasticity using the Breuch-Pagan test, and we do not reject the null hypothesis of homoskedasticity for the whole sample and subsamples. We also checked for multicollinearity and found no evidence for the overall as well as subsamples.

6.6 Assessment of Gender-Based Mean Differences: A Non-Parametric Approach using T-Test

Table 6.4 indicates that the average value of the majority of the variables has significant differences based on gender. However, there are a few variables that have insignificant mean differences. The overall average score, Mathematics, English, Social Science, and Science test scores have significant differences based on gender, and it exhibits that the average test score for female children is less than the average test score of male children, and differences are statistically significant at 1 percent level of significance for all subjects and for Science it is significant at 5 percent. In other words, the mean of average test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 7 percent, and the difference is statistically vital. The average mathematics and English test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 8 and 6 percent, respectively, and the difference is statistically vital. The average social science test scores have a significant difference, and it exhibits that the average test scores for female children are less than the average test scores of male children by almost 8.61 percent.

Similarly, the average science test scores have a statistically significant difference, and it shows that the average test scores for female children compared to male children are lower by almost 6 percent. The student's regional location has a significant gender-based mean difference that means 8.9 percent more female students than the male students are from Andhra. It is also reflected that the gender-based difference for time spent on study apart from school is also significant. It shows that male children spend more time studying apart from school than female students by more than half an hour on an average. Perhaps this gap is because female students have to take care of the domestic cores compared to male students. The difference between the proportion of SCs, STs, and OBCs among males and females is significant, 15.6, 7.9, and 7.7 percent, respectively. Expenditure on education has a significant difference and expenditure on education for female students is higher by ₹3,516 than the male students. The difference in the type of school is statistically significant, and it shows that almost 9 percent more male children are studying in government school compared to female children.

Table 6.4: Gender-based means of explanatory variables for both Districts

Variables	Overall	Male	Female	Difference
Overall Average Score	69.731 (13.566)	72.334 (13.627)	67.049 (13.018)	5.285***
Mathematics Score	69.496 (15.214)	72.372 (15.407)	66.534 (14.481)	5.838***
English Score	69.593 (15.756)	71.876 (15.114)	67.241 (16.397)	4.635***
Social Science Score	70.493 (14.904)	73.613 (15.393)	67.278 (13.711)	6.335***
Science Score	69.341 (15.655)	71.474 (16.318)	67.143 (14.681)	4.332**
Region	0.519 (0.501)	0.474 (0.501)	0.564 (0.498)	-0.089***
Time to study	1.887 (0.863)	2.084 (0.810)	1.684 (0.871)	0.400***
Body Mass Index	19.364 (4.085)	19.213 (4.127)	19.519 (4.052)	-0.306
Years of Education	9.096 (1.889)	9.022 (1.892)	9.173 (1.889)	-0.151
SC	0.470 (0.500)	0.547 (0.500)	0.391 (0.490)	0.156***
ST	0.170 (0.377)	0.131 (0.339)	0.211 (0.409)	-0.079**
OBC	0.359 (0.481)	0.321 (0.469)	0.398 (0.491)	-0.077*
Mother's Education	4.311 (4.412)	4.423 (4.561)	4.195 (4.267)	0.228
Father's Education	5.719 (4.975)	5.701 (5.011)	5.737 (4.956)	-0.036
Expenditure	6828.411 (18410.18)	5096.504 (12408.67)	8612.406 (22929.17)	3515.902*
Household Size	4.470 (1.019)	4.431 (1.097)	4.511 (0.934)	0.081
Assets	65505.93 (90888.89)	67984.67 (85358.39)	62952.63 (96512.7)	5032.04
Type of School	0.789 (0.409)	0.832 (0.375)	0.744 (0.438)	0.088**
Medium of Instruction	0.622 (0.486)	0.657 (0.476)	0.586 (0.494)	0.070
Availability of Fellowship	0.359 (0.481)	0.387 (0.489)	0.331 (0.472)	0.056
Mid-Day Meal	0.807 (0.395)	0.810 (0.394)	0.805 (0.398)	0.006

Note: *p<.1, **p<.05, ***p<.01 and Standard deviations are in parentheses.

Source: Calculated using Primary Survey data, 2021.

6.7 Factors Causing Gender-Gap in Performance

The Gender wise detailed descriptive statistics for the variables are shown in (Appendix Table A6.5 and Table A6.6) for both the states. The result of the Blinder-Oaxaca decomposition is shown in Table 6.5. The mean score is 5.332 for males and 4.942 for female children, yielding a performance gap of 0.390. This difference is primarily and only because of the coefficient effect (significant at 1percent level of significance). The contribution of this effect is 103.59percentof the total difference. The mean Mathematics score is 4.757 for males and 4.373 for female children, yielding a performance gap of 0.384. We see that the difference is primarily and only because of the coefficient effect (significant at 1 percent significance level) and interaction effect (significant at 10 percent level of significance). The contribution of coefficient effect is about 111.20percent. The interaction effect contributes -50.78 percent of the total difference. The mean English score is 4.562 for males and 4.268 for female children, yielding a performance gap of 0.294. The difference is primarily and only because of the coefficient effect (significant at 1 percent level of significance) and interaction effect (significant at 10 percent level of significance). The contribution of coefficient effect is about 134percent. Interaction effect contributes -75.85 percent. The Social Science test score difference between male and female children is 0.425. The coefficient effect is significant at a 1percent level of significance. The difference is mainly because of the coefficient effect. It contributes 86.35 percent of the total difference.

Similarly, The Science test score difference between male and female children is 0.277. The coefficient effect is significant at a 10 percent level of significance. The difference is mainly because of the coefficient effect contributing 86.28 percent to the total difference.

Table 6.5: Blinder-Oaxaca Decomposition Results for Mathematics, English, Social Science, and Science Score

	Overall average Score		Mathematics Score		English Score		Social Science Score		Science Score	
	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value	Coefficient [#]	P value
Male	5.332	0.000	4.757	0.000	4.562	0.000	4.939	0.000	4.566	0.000
Female	4.942	0.000	4.373	0.000	4.268	0.000	4.514	0.000	4.289	0.000
Difference	-0.390	0.002***	-0.384	0.002**	-0.294	0.020**	-0.425	0.001**	-0.277	0.028**
Endowment Effect $\{E(P_M) - E(P_F)\}'\beta_M$	-0.088	0.358	-0.152	0.115	-0.124	0.172	0.003	0.980	-0.036	0.719
Coefficient Effect $E(P_M)'(\beta_M - \beta_F)$	-0.404	0.002***	-0.427	0.001***	-0.394	0.003***	-0.367	0.006***	-0.239	0.077*
Interaction Effect $\{E(P_M) - E(P_F)\}'(\beta_M - \beta_F)$	0.102	0.357	0.195	0.065*	0.223	0.060*	-0.061	0.617	-0.002	0.986

Note: *p<.1, **p<.05, ***p<.01.

Source: Calculated using Primary Survey data, 2021.

[#]Standardised Test Score

6.8 Factors Contributing to Gender Gap in Average Performance

We have discussed before that the endowment interaction effects are not statistically significant in our results.

Table 6.6: Detailed Blinder-Oaxaca Decomposition for Overall Average Test Score

	Overall Average Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Region	0.002	0.901	0.290	0.032**	0.055	0.222
Time to study	-0.108	0.039	-0.832	0.005***	0.160	0.023
Body Mass Index	0.001	0.859	-1.076	0.043**	-0.017	0.556
Years of Education	0.009	0.554	0.351	0.521	0.006	0.646
SC	-0.050	0.257	0.121	0.501	-0.035	0.514
OBC	0.028	0.339	0.081	0.472	0.019	0.526
Mother's Education	-0.000	0.998	0.012	0.924	-0.001	0.926
Father's Education	0.001	0.953	-0.186	0.233	-0.001	0.953
Expenditure on Education	0.003	0.936	0.001	0.980	0.001	0.980
Household Size	-0.014	0.531	-0.113	0.821	-0.002	0.831
Assets	-0.003	0.729	0.148	0.120	-0.011	0.663
Type of School	0.037	0.316	0.474	0.191	-0.050	0.293
Medium of Instruction	0.002	0.893	0.217	0.173	-0.023	0.369
Availability of Fellowship	0.003	0.798	-0.006	0.956	0.001	0.956
Mid-Day Meal	0.000	0.953	-0.072	0.845	0.001	0.919
Total (N= 130)	-0.088	0.358	-0.404	0.002	0.102	0.357

Note: *p<.1, **p<.05, ***p<.01.

Source: Calculated using Primary Survey data, 2021.

However, Table 6.6 shows that the coefficient is significant at a 1 percent level of significance. The entirety of the coefficient effect is explained by the region where the student is residing, Time

spent on study apart from school hours, and BMI. The variable Region and BMI are significant at a 5 percent significance level. The variable time spent on the study is significant at a 1 percent significance level. Region, Time to study, and BMI contribute -71.78, 205.94, and 266.34 percent of the total coefficient effect, respectively. A large part of the coefficient effect is offset by the effect of the other factors on the outcome variable, such as Region, Father's education. We find that the region where students live, time spent on study, and BMI of the students (nutrition value) play a crucial role in contributing to the difference in the expected average test score based on gender.

Similarly, for the Mathematics performance the gender gap is due to the (coefficient effect) differential returns to the female students compared to the male students for time spent studying (see Appendix Table A6.7). We find that the variable time spent on study contributes 187.12 percent of the total coefficient effect. A large part of the coefficient effect is offset by the effect of the other factors on the outcome variable, such as years of education and mid-day meals. The Interaction effect, measures the simultaneous effects of difference in endowment and coefficient effect, contributes -50.78 percent of the total difference in mathematics score. The entirety of the interaction effect is also explained by the variable time to study. The time spent on study apart from school time contributes 78.46 percent of the interaction effects.

The gender gap in English performance is due to differential returns to the variable region, time to study, BMI, and assets. The results show that the Region, Time to study, BMI, and Assets contribute -105.08, 296.70, 264.72, and -45.94 percent of the total coefficient effect, respectively. A large part of the coefficient effect is offset by the effect of the other factors on the outcome variable, such as years of education, SC, and Medium of instruction. The Interaction effect, which measures the simultaneous effects of difference in endowment and coefficient effect, contributes -75.85 percent of the total difference in English score. The entirety of the interaction effect is also explained by the variable time to study. The time spent on study apart from school time contributes 100.45 percent of the interaction effects. We find that the Region, time to study, BMI, and assets play a crucial role in determining the difference in the average English test score based on gender (see Appendix Table A6.8).

The coefficient effect contributes 86.35 percent to the gender gap in educational performance for the Social Science. The variable time to study, BMI, father's education, and type of school

contribute 156.40, 409.54, 96.73 and -222.07 percent of the total coefficient effect, respectively. A large part of the coefficient effect is offset by the effect of the other factors on the outcome variable, such as the type of school. Hence, We find that time spent on study apart from the schooling hours such as doing homework, BMI of the students (nutrition value), father's education, and availability of mid-day meal play a crucial role in explaining the difference in the average Social Science test score based on gender (see Appendix Table A6.9).

For the performance of Science, the entirety of the coefficient effect is explained by the BMI, father's education, and Type of school. The variable BMI, father's education, and type of school contribute 395.40, 158.58, and -302.93 percent of the total coefficient effect, respectively. A large part of the coefficient effect is offset by the effect of the other factors on the outcome variable, such as the type of school. We find that the BMI of the students (nutrition value), father's education, and type of school play a crucial role in explaining the difference in the average science test score based on gender (see Appendix Table A6.10).

6.9 Conclusion

This chapter uses the primary survey data collected from 16 villages of four mandals – Jaipur and Chennur in the Mancherial district of Telangana; Maddipadu, and Tangutur in Prakasham district Andhra Pradesh. The study's goal was to determine why there is such a significant and persistent educational achievement disparity among marginalised groups between males and females in Mancherial and Prakasham districts. The study has utilised variety of background characteristics of the children. In this exercise, the study tried to analyse attributes that explain the average overall performance gap between genders and performance gap in Mathematics, English, Social Science, and Science. On average, the male students' overall performance is high compared to the female students. The same trend is visible for Mathematics, English, Social Science, and Science performance. The study also noticed that region significantly influences students' overall performance and performance in individual subjects. Regression results depict that Andhra Pradesh students perform lower than Telangana students. Interestingly, the region is insignificant for male students, but it significantly influences their performance.

Further, the non-parametric approach (t-test) study found a gender-based mean difference for the variables. We found a significant mean difference for the overall average performance of male and

female students, where male students outperformed female students. Similar results are found for the Mathematics, English, Social Science, and Science performance. We then segregated our data set into two groups, males and females, for all subjects and overall performance. Using the threefold Blinder-Oaxaca decomposition for overall average performance and performance in Mathematics, English, Social Science, and Science, we found that majority of the difference between them is due to coefficient effect, or the differential returns to the background characteristics. It is the region where students are from, time spent on study apart from school hours, and BMI contributing significantly to the overall average performance. For Mathematics, time spent on study significantly contributes to the gender gap. Additionally, it is the region, time to study or time spent studying by a child apart from school hours, and BMI for the English performance. For Social Science, time to study BMI, father's education, and type of school contribute significantly to the performance gap between the genders. Lastly, for Science, the BMI, father's education, and type of school plays a significant role in the gender gap.

Chapter-VII

Major Findings and Policy Suggestions

“If one girl with an education can change the world, just imagine what 130 million can do.”

-Malala Yousafzai

7.1 Introduction

This thesis analyses the gender gap in the education performance of the children in United Andhra Pradesh, India. The study focuses on child-specific features, parental education and involvement in school activities, household characteristics, type of school, and other features. The available literature focuses on the relationship of these background features with educational performance. The available literature analyses the gender gap in educational performance but this study goes beyond to analyse the gender gap and finds the factors responsible for gender gap and, using the Blinder-Oaxaca decomposition method, measures the extent to which these background features contribute to the gender gap in educational performance. This study uses the marks scored by children in Mathematics, English, Social Science, and Science in the previous year examination as dependent variables. The variables gender, time to study, BMI, social background, years of education, parental education, expenditure on education, household assets and size, type of school, availability of fellowship, computer, and mid-day meals, medium of instruction are used as explanatory variables. The study has used longitudinal panel data set of Young Lives Survey of fourth round for older cohort. The study has also collected data from the primary survey to collect the information about the children from marginalised groups living in Mancherla and Prakasham district of Telangana and Andhra Pradesh.

7.2 Objective and Research Questions of the Study

The study attempts to find the factors causing the gap and how these factors contribute to the gender gap in educational performance. The study also answers which type of school has more gender gap in educational performance and to what extent these factors contribute. The study also

deals with the gender gap in educational performance among marginalised groups in Telangana and Andhra Pradesh.

Research Questions:

Followings are the research questions of the study.

1. Is there a gender-based disparity in the educational performance?
2. If there is a disparity, what factors cause gender disparity and the extent to which these factors contribute to the gender gap in educational performance?
3. Does there exist any gender gap in educational performance in public and private schools?
4. Which type of school has more significant gender disparity in educational performance and what are the variables causing this gender disparity?
5. Is there any gender gap in educational performance among marginalised groups in Telangana and Andhra Pradesh?
6. If yes, what are the variables causing this gap in educational performance in both the states separately?
7. Is there any gender disparity in educational performance across region and what is the role of region in determining the gender gap in educational performance among the marginalised groups and other determinants affecting educational performance between states?

7.3 Methodology and Data Sources

The study has done a primary data collection. The fieldwork consists of a survey for collecting information through a well-structured questionnaire that contains the information about household characteristics, parental qualification and involvement in school activities, demographic and other particular of the children, school infrastructure, expenditure on education, fellowship/scholarship, how much time a child spends on different activities during a typical day, and details of the five most valuable assets available at household. It has collected 270 samples from 16 villages of four mandals – Jaipur and Chennur in Mancherla district of Telangana; Maddipadu and Tangutur in

Prakasham district of Andhra Pradesh. This information were collected using multi-stage (random) sampling. At first, the two districts from Telangana and Andhra Pradesh were selected based on the highest SC population. Subsequently, two mandals were chosen from each district having the highest SC population. The villages were chosen randomly – Mittapalle, Venkataopally and Madhigunta in Jaipur mandal, Kommera, Rachapally, Subbarampally, Chellaipet and Erraguntapally in Chennurmandal, Ghadiyapudi, Maddipadu, Vellanpalli and Kolachankota in Maddipadumandal, Ananthavaram, Jammunapalem, Pullareddipalli and Kakuturivaripalem in Tanguturmandal. Within the villages, the population was stratified based on two criteria – a) Children studying in classes VI-XII, and b) Children belonging to SC-ST-OBC categories. Further, snowball sampling method was used to identify the sample population meeting the aforementioned conditions. Data collection was carried out between the month of February and September, 2021. The collected data is divided into four groups; Child specific features, Parental Education, Household characteristics, and other features. To measure the child's performance, the marks scored in the previous year exam were collected for the Mathematics, English, Social Science, and Science subjects. To measure the child's overall performance, the average marks scored in all the subjects is taken into consideration.

In addition to the primary data collected through fieldwork, study has also used the data from secondary sources. The information utilised for the study is the dataset collected by Young Lives Survey which is one of a kind. The data set is very intensive and can be considered rich in providing information on all these aspects for both the age cohorts for 2002–2014. We have utilised the fourth round of YLS data for older cohorts to measure the gender- gap in educational performance in mathematics and English and brought out the factors causing gender-gap. Further, it assesses the gender gap in government and private school and bring out to what extent these factors are causing gender gap in educational performance. To study the educational performance and the gender gap, it is imperative to track the school-going children. In other words, it requires a longitudinal study with different background characteristics of the children and parents to approach these questions or fulfil the study's objective. The study has also used ASER's (2010, 2014) data, united Andhra Pradesh compared with national level data.

The study has used the descriptive statistics yielding the important information to understand the study. Further, the study has utilised the simple regression model to see the impact of the

background characteristics on the educational performance and a non-parametric approach has been taken by using t-test for the study to check the background features having gender-based significant difference.

The study has also used Blinder-Oaxaca decomposition method to identify the factors responsible for gender gap and to measure the extent to which these factors are contributing to the gender difference in educational performance.

7.4 Major Findings

This section devoted to summarise the findings of this study.

Gender Gap in Educational Performance in United Andhra Pradesh

The study analyses the gender gap in educational performance using the variety of background characteristics in chapter three. The chapter has utilised the fourth round of Young Lives Surveys data (2013-14), India (United Andhra Pradesh), for the older cohort. It attempted to understand and explain the educational performance gap between male and female children using the variety of their background characteristics. This chapter aims to answer if there is a gender-based disparity in educational performances due to the children's background characteristics. What factors cause a gender-gap and the extent to which these factors contribute to the gap in educational performance? The chapter has taken Mathematics and English test scores as an indicator of educational performance, which are the analysis's dependent variables. Educational performance is used as a function of child-specific features, parental education and household features which are our explanatory (independent) variable categories. The chapter has used simple linear regression model, where the obtained Mathematics and English test scores showing whole sample size has been regressed on explanatory variables through diversifying male and female samples. The study has also checked for homoskedasticity using the Breuch-Pagan test, and did not reject the null hypothesis of homoskedasticity for the whole sample and subsamples. The study also checked for multicollinearity and found no evidence for the overall sample as well as subsamples. The chapter analyses gender-based mean difference by using a non-parametric approach. A t-test is being used to analyse the gender-based mean difference for all variables individually.

- The study found a significant difference in the performance of the male and female children, where males outperformed females.
- Apart from gender it is also observed (first two columns of the Table 3.2) that the variables Time to Study, Body Mass Index, Years of Education, Caste (SC and ST), Mother's education, Expenditure on Education, Assets, and Availability of Computer in Household have significant effects on the Mathematics test score (educational performance).
- The study also found a difference in the English performance based on the gender where the result shows that English performance for female children is lower than the male children
- Apart from gender, the study finds that the variables Time to study, Body Mass Index (BMI), Years of Education, Social Background, Parental Education, Expenditure on Education, Household Size, and Availability of computer in Household have a significant effect on the English test (educational performance) scores.
- The study found that variables Mathematics score, English score, BMI, Years of Education, Students from Schedule Caste and OBC, availability of fellowship Father's education, Expenditure on education have significant gender-based mean difference.
- Looking at the average values of the background characteristics, we noticed that males have significantly better characteristics compared to females.
- We found that majority of the performance difference between them is because of the coefficient effect or the differential returns to the background characteristics.
- The BMI and years of schooling contributed significantly to the gender gap in Mathematics Performance.
- For English test, we found that majority of the performance difference between them is because of the difference in the average value of the background characteristics (endowment) and the differential returns to the background characteristics (coefficient effect). The endowment's contribution and coefficient effect is 35.28 percent and 80.26 percent of the total difference.
- In the coefficient effect, it is the mother's education and in the endowment effect, the years of schooling and expenditure on education contribute significantly.

Gender Gap in Academic Performance in Public and Private Schools: An Analysis of Young Lives Survey for India

Chapter four has utilised the information about the type of school a child is enrolled from the fourth round of Young Lives Surveys data, India (United Andhra Pradesh), for the older cohort. The objectives of chapter four is to analyse whether the gender gap in educational performance exists in both public and private schools. The second objective is to identify which school has a more significant gender disparity in educational performance and what are the variables causing this gender disparity in educational performance. Data showed that the average marks scored by students enrolled in private schools in mathematics and English is more than the students enrolled in public schools. It is visible that the gender gap in enrollment is more in private schools - more male students are enrolled in private school compared to the female students. The value of BMI for both public and private school children is almost same. Interestingly, the more students from OBC background are enrolled in private school than the public school. Half of the students enrolled in private and one-third of the students enrolled in public schools are from OBC background. The average years of schooling received by a child enrolled in private school are almost lower by a year compared to those enrolled in public school. It indicates that the student enrolled in public school drop their school earlier than the private school student. Where students receive four times and twice more years of education compared to their mother's and father's education, respectively. Noticeably, parental education of the public school going children are lower than the private school-going children. The same percentage of the students enrolled in public and private schools have availability of the fellowship. Expenditure on education and value of household assets (wealth) play a significant role in educational performance of the children. Average expenditure on education of students enrolled in private school is almost five times higher than the expenditure on public school students by parents. Similarly, the value of the household assets is more for the private school student compared to the public school-going student. The study has taken Mathematics and English test scores as a measure to gauge educational performance which is the dependent variable in the analysis. The acquired Mathematics and English test scores for the whole sample size of the children enrolled in public schools have been regressed on independent variables and separately for male and female samples who are in public school. The results have been procured after utilising a simple linear regression method.

- Gender, years of education, parental education, and expenditure on education, have significant effect on the educational performance (Mathematics and English test score) for children enrolled in public schools for the whole sample size. And for the private school variables like gender, time to study, years of education, social background, and expenditure on education have significant effect on the educational performance (Mathematics and English test score).
- The study finds that variable Mathematics score, English score, time to study, BMI, years of education, Social background (SC, SC, OBC), availability of fellowship, parental education, and expenditure on education for public school children, have significant gender-based mean difference.
- Similarly, for the private school students the variables Mathematics score, time to study, students from ST and OBC background, parental education and household assets have significant mean difference based on the gender.
- We also find that the gender gap in learning outcome is lesser in private schools compare to public school children.
- The study shows that majority of the performance difference between them is because of the differential returns to the background characteristics.
- The contribution of coefficient effect is 85.96 and 98.71 percent of the total difference for Mathematics and English test score.
- For English test score, it is the household size which contribute significantly to the performance gap in public school.
- In case of private schools, result shows that majority of the performance difference for Mathematics test score between them is because of the differential returns to the background characteristics (coefficient effect).
- The study finds that, for Mathematics performance, there are differential returns to the same average years of education based on gender, where it is greater for the male children, studying in private school, compared to the females.

- The study also indicates that differential returns to the same average mother's education based on gender.

Gender Gap in Educational Performance: A Micro Level Analysis

The study used YLS data for the older cohort conducted in united Andhra Pradesh in 2013. However, the YLS data set has various limitations. The information about the performance was only measured or available for three subjects: mathematics, English, and Telugu. Additionally, the survey was carried out in erstwhile Andhra Pradesh during 2013. However, the state of Andhra Pradesh was bifurcated in 2014. As a result, a separate Telangana State was formed. After creating the separate Telangana State, the demography of both the states has changed significantly, and the geographical boundaries have also changed. Hence, it is essential to study both states separately as different governments have different policies. Finally, the objective of the study is to analyse the gender gap in educational performance among marginalised groups. Mancheri and Prakasham districts of Telangana and Andhra Pradesh have the highest proportion of the SC population.

However, YLS collected data from seven districts that have not included the Mancheri and Prakasham districts. As mentioned earlier, a primary survey was undertaken for the study to overcome the shortcoming of the information provided by YLS data. A primary survey is conducted in 16 Andhra Pradesh and Telangana State villages from February to September 2021. The study has collected data to measure the gender gap in educational performance using multi-stage (random) sampling. It has collected 270 samples from 16 villages of four mandals – Jaipur and Chennur in the Mancheri district of Telangana; Maddipadu and Tangutur in Prakasham district of Andhra Pradesh. The survey was carried out to measure gender-gap in education performance among the marginalised population in Andhra Pradesh and Telangana. It also aims to identify the factors contributing to the gender- gap in educational performance in Andhra Pradesh and Telangana. The collected data is divided into four groups; Child specific features, Parental Education, Household characteristics, and other features. To measure the child's performance, the marks scored in the previous year exam were collected for the Mathematics, English, Social Science, and Science subject. To measure the child's overall performance, the average marks scored in all the subject is taken into consideration.

- The study finds that on average, the overall performance for male students is high compared to the female students. The same trend is visible for Mathematics, English, Social Science, and Science performance.
- We find a significant mean difference in the overall performance of male and female students, where male students outperformed female students for Telangana State and Andhra Pradesh. Similar results are found for the Mathematics, English, Social Science, and Science performance.
- The study analysed that the gender-based mean difference is more for Telangana than Andhra Pradesh concerning overall performances.
- Majority of the difference between genders is due to the differential returns to the background characteristics.
- For the state of Telangana, BMI, Mother's education level, and Mid-day meal contributes significantly to the overall performance and Mathematics performance. Additionally, it is Time to study or Time spent on study by a child apart from school hours and BMI for the English performance. For Social Science, BMI and father's education contribute significantly to the performance gap between the genders.
- The study also finds, for Andhra Pradesh, the difference is only explained by the coefficient effect for Mathematics and Social Science.
- For Andhra Pradesh, variables Time spent on study apart from school hours and mid-day meal contribute to the performance gap whereas for Social Science, Time spent on study, BMI, Type of school, and Mid-day meal significantly contribute to the performance gap between the male and female students for Andhra Pradesh.

Gender Gap and access to education a regional perspective

This chapter analyses the educational performance gap based on gender among the marginalised communities in Andhra Pradesh and Telangana. The chapter also attempts to answer whether there is any gender gap due to regional differences among the children. The study has utilised a variety of background characteristics of the children. In this exercise, the study tried to analyse attributes that explain the average overall performance gap between genders and performance gap in Mathematics, English, Social Science, and Science.

- For the Mathematics test, female students' average marks are lower than the combined marks and even lower than male students. The study also finds a similar gap in average marks scored by students in English, Social Science and Science, where female student score lower than male students.
- The study also reflects that, on average, almost 79 percent of the total students are studying in government schools, about 83 percent of the total males and 74 percent of the total female are in government schools. On average, 62 percent of the students are studying in English medium schools, approximately 66 percent of the male and 59 percent of the female students are studying in English medium. It shows that more male students are studying in English medium schools than female students. Overall only 36 percent of the students have availability of fellowship, only 39 percent of the females and just 33 percent of the females have fellowship. About 81 percent of the students do not have access to mid-day meals, 81 percent of males and 80 percent of the females are not getting mid-day meals in the district of Mancherial and Prakasham districts Telangana and Andhra Pradesh, respectively.
- The study also finds that overall test score is significantly associated with the region, gender, time to study, years of education, social background, expenditure on education, type of school, medium of instruction, availability of fellowship, and mid-day meal.
- On average, the male students' overall performance is high compared to the female students. The same trend is visible for Mathematics, English, Social Science, and Science performance.
- The study also noticed that region significantly influences students' overall performance and performance in individual subjects. It also depicts that Andhra Pradesh students perform lower than Telangana students.
- We find a significant mean difference for the overall average performance of male and female students, where male students outperformed female students. Similar results are found for the Mathematics, English, Social Science, and Science performance.
- We find that majority of the difference between genders is due to coefficient effect, or the differential returns to the background characteristics.
- The region where students are from, time spent on study, and BMI are contributing significantly to the overall average performance.
- For Mathematics, time spent on study is significantly contributes to the gender gap.

- It is the region, time to study or time spent on study by a child apart from school hours, and BMI for the English performance.
- For Social Science, time to study BMI, father's education, and school type contribute significantly to the performance gap between the genders.
- Lastly, for Science, the BMI, father's education, and type of school play a significant role in the gender gap.

7.4 Policy Recommendations

- The study finds that years of education are significant to determine educational performance, especially in the case of female children. Thus, it is required to make policy and incentive schemes for students to encourage them to continue their studies, particularly female students.
- The study also clearly pointed out that BMI significantly affects educational performance and is also one of the factors contributing to the gender difference in educational performance. Therefore, nutritious food should be included in the mid-day meals to improve the height and weight ratio of the students.
- Another finding of the study is that mid-day meals are one of the factors that contribute to the gender gap in educational performance. Hence, the government should focus on making policies or programmes to enhance the mid-day meal programme.
- To improve the students' overall health, the government should develop health schemes that focus on school-going children. In order to achieve good results, the mid-day meal programme should be integrated with the government's ongoing health awareness campaigns.
- Additionally, the study also finds that the parental education level has a significant effect on the performance of school-going children. Parents of the private going school children have more years of education. Therefore, their performance is higher than public school children. Thus, the study recommends the provision of and a proposal for an education programme to motivate their children, improve communication with teachers and administration staff, and conduct periodic vision and hearing screenings.
- Lastly, the type of school is a significant factor in determining the gender gap in educational performance. It is found that public school children are performing lower than private

school children and the gender-based gap in performance is higher among public school-going children. It is also observed that most students from SC and ST backgrounds are enrolled in public schools. Thus, to improve the facility and reduce the gender gap in educational performance government should focus on building new schools with better infrastructure. The government should also focus on improving the numbers and infrastructure of the residential schools as the majority of the underprivileged students depend on them.

7.5 Scope for the future research

The study has aimed to measure the gender gap in educational performance. The study attempted to find the background feature and extent to which it contributes to the gender gap. The study has analysed this gender disparity in educational performance, comparing different types of schools and among marginalised groups in Telangana and Andhra Pradesh using primary and secondary data. However, certain constraints to this analysis should be considered, and delving into these caveats might lead to more research in the field.

- Future research should focus on analysing the gender gap in educational performance by including more factors that can be extended to the other states and the national level.
- The Covid-19 has affected the marginalised sections of the country in an unprecedentedly manner. Thus, Covid-19 offers potential new ways of understanding how newer factors affect marginalised groups in India, especially considering the gender gap in educational performance among those groups.
- There can be further research to analyse the gender gap in educational performance **between** the social groups, which will help to compare the different social groups.

BIBLIOGRAPHY

- Adzido, R. Y. N., Dzogbede, O. E., Ahiave, E., & Dorkpah, O. K. (2016). Assessment of Family Income on Academic Performance of Tertiary Students: The Case of Ho Polytechnic, Ghana. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 6(3). <https://doi.org/10.6007/ijarafms/v6-i3/2221>
- Alderman, H., Behrman, J. R., Ross, D. R., & Sabot, R. (1996). Decomposing the gender gap in cognitive skills in a poor rural economy. *Journal of Human Resources*, 31(1), 229–254. <https://doi.org/10.2307/146049>
- Ali, M. I., & Faaz, M. (2017). Influence of Study Habits on Academic Achievement of Senior Secondary School Students in relation to Gender and Community. *RESEARCH REVIEW International Journal of Multidisciplinary Secondary*, 3(6), 174–175.
- Alimi, O. S., Ehinola, G. B., & Alabi, F. O. (2012). School types, facilities and academic performance of students in senior secondary schools in Ondo State, Nigeria. *International Education Studies*, 5(3), 44–48. <https://doi.org/10.5539/ies.v5n3p44>
- Alon, S. (2007). The influence of financial aid in leveling group differences in graduating from elite institutions. *Economics of Education Review*, 26(3), 296–311. <https://doi.org/10.1016/j.econedurev.2006.01.003>
- Al-Kamil, E. A. (2005). A Study OF Factors Affecting Academic Performance of Intermediate School Pupils in Basrah. *The Medical Journal of Basrah University*, 23(1), 31–37.
- Alwani, S. E. (2018). *Early childhood education in India: A possible investment in better outcomes? A quantitative analysis using Young Lives India*.
- Alwin, D. F. (1991). Family of Origin and Cohort Differences in Verbal Ability. *American Sociological Review*, 56(5), 625–638.

- Ansong, D., Chowa, G. A., & Sherraden, M. (2015). Household assets, academic expectations, and academic performance among Ghanaian junior high school students: Investigating mediation. *Children and Youth Services Review*, 50, 101–110. <https://doi.org/10.1016/j.childyouth.2015.01.016>
- Arcidiacono, P. (2005). Affirmative action in higher education: How do admission and financial aid rules affect future earnings? *Econometrica*, 73(5), 1477–1524. <https://doi.org/10.1111/j.1468-0262.2005.00627.x>
- Arteaga, I., & Glewwe, P. (2014). Achievement Gap between Indigenous and Non-Indigenous Children in Peru An Analysis of Young Lives Survey Data. In *Young Lives Working Paper 130* (Issue June).
- ASER. (2008). India and Andhra Pradesh: Arithmetic and reading level. In Annual Status of Education. <http://www.asercentre.org/education/data/india/statistics/level/p/66.html>
- ASER. (2010). India and Andhra Pradesh: Arithmetic and reading level. In Annual Status of Education. <http://www.asercentre.org/education/data/india/statistics/level/p/66.html>
- ASER. (2014). India and Andhra Pradesh: Arithmetic and reading level. In Annual Status of Education. <http://www.asercentre.org/education/data/india/statistics/level/p/66.html>
- ASER. (2018). *ASER 2018 (Rural) findings*.
- Attewell, P., & Battle, J. (1999). Home computers and school performance. *Information Society*, 15(1), 1–10. <https://doi.org/10.1080/019722499128628>
- Azubuike, O. B., & Little, A. W. (2019). Learning motivations, learning outcomes and gender in Vietnam. In *Young Lives*.
- Balatchandirane, G. (2003). Gender Discrimination in Education and Economic Development: A study of South Korea, China and India. *International Studies*, 40(4), 349–378.

- Bharadwaj, P., De Giorgi, G., Hansen, D., & Neilson, C. A. (2016). The gender gap in mathematics: Evidence from Chile. *Economic Development and Cultural Change*, 65(1), 141–166. <https://doi.org/10.1086/687983>
- Blinder, A. S. (1973). Wage Discrimination : Reduced Form and Structural Estimates. *The Journal of Human Resources*, 8(4), 436–455.
- Blake, J. (1981). Family Size and the Quality of Children. *Demography*, 18(4), 421–442. <https://doi.org/10.2307/2060941>
- Blake, J. (1985). Number of Siblings and Educational Mobility. *American Sociological Review*, 50(1), 84–94.
- Blake, J. (1989). *Family Size and Achievement* (Vol. 3). University of California Press.
- Blau, P. M., & Duncan, O. D. (1967). *The American Occupational Structure*. John Wiley & Sons Inc.
- Breda, T., & Napp, C. (2019). Girls’ comparative advantage in reading can largely explain the gender gap in math-related fields. *Proceedings of the National Academy of Sciences of the United States of America*, 116(31), 15435–15440. <https://doi.org/10.1073/pnas.1905779116>
- Census (2011), Office of the Registrar General & Census Commissioner, India, Ministry of Home Affairs, Government of India.
- Chiu, J., Economos, J., Markson, C., Raicovi, V., Howell, C., Morote, E., & Inserra, A. (2016). Which Matters Most? Perceptions of Family Income or Parental Education on Academic Achievement. *New York Journal of Student Affairs*, 16(2), 3–16. <http://files.eric.ed.gov/fulltext/EJ1015240.pdf>
- Crookston, B. T., Forste, R., McClellan, C., Georgiadis, A., & Heaton, T. B. (2014). Factors associated with cognitive achievement in late childhood and adolescence: The Young Lives cohort study of children in Ethiopia, India, Peru, and Vietnam. *BMC Pediatrics*, 14(1), 1–9. <https://doi.org/10.1186/1471-2431-14-253>

- Chung, K. K. H. (2015). Socioeconomic Status and Academic Achievement. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (Second Edition, Vol. 22). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.92141-X>
- Chudgar, A., & Quin, E. (2012). Relationship between private schooling and achievement: Results from rural and urban India. *Economics of Education Review*, 31(4), 376–390. <https://doi.org/10.1016/j.econedurev.2011.12.003>
- Chakraborty, T., & Jayaraman, R. (2019). School feeding and learning achievement: Evidence from India's midday meal program. *Journal of Development Economics*, 139(April), 249–265. <https://doi.org/10.1016/j.jdeveco.2018.10.011>
- Chand, S. (2013). Study Habits of Secondary School Students in relation to Type of School and Type of Family. *International Journal of Social Science & Interdisciplinary Research*, 2(7), 90–96.
- Channana, K. (2000). Treading the Hallowed Halls: Women in Higher Education in India. *Economic and Political Weekly*, 35(12), 1012–1022. [https://doi.org/DOI: 10.2307/4409055](https://doi.org/DOI:10.2307/4409055)
- Chinyoka, K., & Naidu, N. (2014). Influence of home based factors on the academic performance of girl learners from poverty stricken families: A case of Zimbabwe. *Mediterranean Journal of Social Sciences*, 5(6 SPEC. ISSUE), 223–232. <https://doi.org/10.5901/mjss.2014.v5n6p223>
- Chung, K. K. H. (2015). Socioeconomic Status and Academic Achievement. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition* (Second Edition, Vol. 22). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.92141-X>
- Collins, C., Kenway, J., & McLeod, J. (2000). Factors influencing the Educational Performance of Males and Females in School and Their Initial Destinations after Leaving School. In *Canberra: Department of Education, Training and Youth Affairs*.

- Considine, G., & Zappalà, G. (2002). The influence of social and economic disadvantage in the academic performance of school students in Australia. *Journal of Sociology*, 38(2), 129–148. <https://doi.org/10.1177/144078302128756543>
- Demirbas, O. O., & Demirkan, H. (2007). Learning styles of design students and the relationship of academic performance and gender in design education. *Learning and Instruction*, 17(3), 345–359. <https://doi.org/10.1016/j.learninstruc.2007.02.007>
- Desai, S. (1994). *Geographic Inequalities and Demographic Behaviour - India*.
- Dickerson, A., McIntosh, S., & Valente, C. (2015). Do the maths: An analysis of the gender gap in mathematics in Africa. *Economics of Education Review*, 46, 1–22. <https://doi.org/10.1016/j.econedurev.2015.02.005>
- Dornbusch, S. M., Ritter, P. L., Leiderman, P. H., Donald, F., Roberts, D. F., & Fraleigh, M. J. (1987). The Relation of Parenting Style to Adolescent School Performance. *Child Development*, 58(5), 1244–1257.
- Downey, D. B. (1994). School performance of children from single-mother and single-father families: Economics or Interpersonal Deprivation? *Journal of Family Issues*, 15(1), 129–147.
- Downey, D. B. (1995). When Bigger Is Not Better: Family Size, Parental Resources, and Children's Educational Performance. *American Sociological Review*, 60(5), 746–761.
- Dreze, J., & Goyal, A. (2001). Future of Mid-Day Meals. *Economic and Political Weekly*, 38(44), 4673–4683. <https://doi.org/DOI: 10.2307/4414222>
- Duraisamy, P. (2002). Changes in returns to education in India, 1983-94: By gender, age-cohort and location. *Economics of Education Review*, 21(6), 609–622. [https://doi.org/10.1016/S0272-7757\(01\)00047-4](https://doi.org/10.1016/S0272-7757(01)00047-4)
- Duraisamy, P., & Duraisamy, M. (1993). Returns to scientific and technical education in India. *Margin*, 25(4), 396–406. <https://doi.org/10.1080/13600818.2013.786694>

- Ernst, C., & Angst, J. (1983). Birth order: Its influence on personality. In *Springer Science & Business Media*. <https://doi.org/10.1227/01.NEU.0000349921.14519.2A>
- Espinosa, A. M. G. (2017). *Estimating the education production function for cognitive and non-cognitive development of children in Vietnam through structural equation modelling using Young Lives data base*. www.younglives.org.uk
- Featherman, D. L., & Hauser, R. M. (1978). Opportunity and change. In *Studies in Population*.
- Farooq, M. S., Chaudhry, A. H., Shafiq, M., & Berhanu, G. (2011). Factors Affecting Students' Quality of Academic Performance: A case of Secondary Level. *Journal of Quality and Technology Management*, VII(II), 1–14.
- Faulk, D., Srinivasan, A. K., & Bingham, J. (2012). Sources of funding and academic performance in economics principles courses. *Journal of Economic Education*, 43(2), 165–181. <https://doi.org/10.1080/00220485.2012>.
- Fergusson, D. M., & Horwood, L. J. (1997). Gender differences in educational achievement in a New Zealand birth cohort. *New Zealand Journal of Educational Studies*, 32(1), 83–96.
- Fryer, Roland, G. J., & Levitt, S. D. (2010). An Empirical Analysis of the Gender Gap in News Consumption. *American Economic Journal: Applied Economics*, 2(2), 210–240. <https://doi.org/10.1080/08997764.2012.700976>
- George, J. F., Iaeono, S., & Kling, R. (1995). Learning in Context: Extensively Computerized Work Groups as Communities-Of-Practice. *Accounting, Management and Information Technologies*, 5(3/4), 185–202.
- Ghose, M. (2011). Gender Bias in Education in India. *Journal of Economic and Social Development*, VII(2), 118–128.
- Giacquinta, J. B., Bauer, J. A., & Levin, J. E. (1993). *Beyond technology's promise: An examination of children's educational computing at home*. Cambridge University Press.

- Glewwe, P., Jacoby, H. G., & King, E. M. (2001). Early childhood nutrition and academic achievement: A longitudinal analysis. *Journal of Public Economics*, 81(3), 345–368. [https://doi.org/10.1016/S0047-2727\(00\)00118-3](https://doi.org/10.1016/S0047-2727(00)00118-3)
- Government of Andhra Pradesh (2021). *Socio Economic Report 2020-21*. Department of Planning.
- Government of Telangana (2021), *Telangana Socio Economic Outlook 2021*, Planning Department.
- Goyal, S. (2009). Inside the house of learning: The relative performance of public and private schools in Orissa. *Education Economics*, 17(3), 315–327. <https://doi.org/10.1080/09645290903142577>
- Goyal, S., & Pandey, P. (2009). How do government and private schools differ? Findings from two large Indian states. *International Bank for Reconstruction and Development, The World Bank*, 30, 1–26. <https://openknowledge.worldbank.org/handle/10986/17962>
- Grave, B. S. (2011). The effect of student time allocation on academic achievement. *Education Economics*, 19(3), 291–310. <https://doi.org/10.1080/09645292.2011.585794>
- Heady, C. (2003). The effect of child labor on learning achievement. *World Development*, 31(2), 385–398. [https://doi.org/https://doi.org/10.1016/S0305-750X\(02\)00186-9](https://doi.org/https://doi.org/10.1016/S0305-750X(02)00186-9)
- Hermann, S., Rohrmann, S., Linseisen, J., May, A. M., Kunst, A., Besson, H., Romaguera, D., Travier, N., Tormo, M.-J., Molina, E., Dorronsoro, M., Barricarte, A., Rodríguez, L., Crowe, F. L., Khaw, K.-T., Wareham, N. J., Boeckel, P. G. van, Bueno-de-Mesquita, H. B., Overvad, K., ... Peeters, P. H. (2011). The association of education with body mass index and waist circumference in the EPIC-PANACEA study. *BMC Public Health*, 11(1), 169.
- Hernandez-Zavala, M., Patrinos, H. A., Sakellariou, C., & Shapiro, J. (2006). *Quality of Schooling and Quality of Schools for Indigenous Students in Guatemala, Mexico and Peru*.
- Heyns, B. (1978). *Summer learning and the effects of schooling*. Academic Press.

- Hill, Russel and Stafford, F. P. (1974). Allocation of Time to Preschool Children and Educational Opportunity. *The Journal of Human Resources*, 9(3), 323–341.
- Hooda, M., & Devi, R. (2017). Type of school, locality and gender as determinant of achievement in mathematics among secondary school students. *International Journal of Advanced Research in Management and Social Sciences*, 6(11), 79–91.
- Kaushik, A. (2018). From Hunger Deaths to Healthy Living: A Case Study of Dalits in Varanasi District, Uttar Pradesh, India. *Contemporary Voice of Dalit*, 10(2), 1–9. <https://doi.org/10.1177/2455328x17744623>
- James, Z., & Woodhead, M. (2014). Choosing and changing schools in India's private and government sectors: Young Lives evidence from Andhra Pradesh. *Oxford Review of Education*, 40(1), 73–90. <https://doi.org/10.1080/03054985.2013.873527>
- Jamil, S., Tariq, R. H., & Jamil, M. (2016). School Type and Gender wise Studies of Understanding of Three Dimensional Diagrams among Children ' s of 8 Years of Age. *Pakistan Journal of Social Sciences (PJSS)*, 36(2), 635–640.
- Jann, B. (2008). The Blinder-Oaxaca decomposition for linear regression models. *The Stata Journal*, 8(4), 453–479.
- Jelas, Z. M., & Dahan, H. M. (2010). Gender and educational performance: The Malaysian perspective. *Procedia - Social and Behavioral Sciences*, 7(C), 720–727. <https://doi.org/10.1016/j.sbspro.2010.10.098>
- Jensen, A. R. (1980). Précis of Bias in Mental Testing. *The Behavioral and Brain Sciences*, 3(3), 325–371.
- Kapur, R. (2018). *Factors Influencing the Student ' s Academic Performance in Secondary Schools in India*. https://www.researchgate.net/publication/324819919_factors_influencing_the_students_academic_performance_in_secondary_schools_in_india

- Khera R. (2006). Mid-day meals in primary schools: Achievements and Challenges. *Economic & Political Weekly*, 4742–4750.
- Kingdon, G. (1996). The Quality and Efficiency of Public and Private Schooling: A Case Study of Urban India. *Oxford Bulletin of Economics and Statistics*, 58(1), 57–82.
- Kingdon, G. G. (2007). The progress of school education in India. *Oxford Review of Economic Policy*, 23(2), 168–195. <https://doi.org/10.1093/oxrep/grm015>
- Klasen, S., & Lamanna, F. (2009). The impact of gender inequality in education and employment on economic growth: New evidence for a panel of countries. *Feminist Economics*, 15(3), 91–132. <https://doi.org/10.1080/13545700902893106>
- Kohn, M. (1969). Class and conformity: A study in values. In *University of Chicago Press*.
- Kumar, M. S. (2008). Gender Discrimination and Status of Women in India. In *Munich Personal RePEc Archive*.
- Lareau, A. (1987). Social Class Differences in Family-School Relationships: The Importance of Cultural Capital. *Sociology of Education*, 60(2), 73–85. <https://doi.org/10.2307/2112583>
- Legewie, J., & DiPrete, T. A. (2012). School Context and the Gender Gap in Educational Achievement. *American Sociological Review*, 77(3), 463–485. <https://doi.org/10.1177/0003122412440802>
- Lin, T., & Lv, H. (2012). The effects of family income on children's education: An empirical analysis of CHNS data. *South China Population (China)*, 27(4), 46–53. <https://doi.org/10.24104/rmhe/2017.04.02002>
- Lind, A.-M. (2006). *Approaching gender bias in practical international development work*.
- Machebe, C. H., Ezegbe, B. N., & Onuoha, J. (2017). The Impact of Parental Level of Income on Students' Academic Performance in High School in Japan. *Universal Journal of Educational Research*, 5(9), 1614–1620. <https://doi.org/10.13189/ujer.2017.050919>

- Maddah, M., Eshraghian, M. R., Djazayery, A., & Mirdamadi, R. (2003). Association of body mass index with educational level in Iranian men and women. *European Journal of Clinical Nutrition*, 57(7), 819–823. <https://doi.org/10.1038/sj.ejcn.1601615>
- Marjoribanks, K. (1979). *Families and Their Learning Environments* (1st ed.). Routledge. <https://doi.org/10.4324/9781315225562>
- McKee, D., & Todd, P. E. (2011). The longer-term effects of human capital enrichment programs on poverty and inequality: Oportunidades in Mexico. *Estudios de Economia*, 38(1), 67–100.
- Mercy, J. A., & Steelman, L. C. (1982). Familial Influence on the Intellectual Attainment of Children. *American Sociological Review*, 47(4), 532–542. <https://doi.org/https://doi.org/10.2307/2095197>
- Nagi, K. S., & Sridevi, G. (2020). Gender Gap in Academic Performance in Public and Private Schools : An Analysis of Young Lives Survey for India. *Empirical Economics Letters*, 19(9).
- Naing, N. N. (2003). Determination of sample size. *Malaysian Journal of Medical Sciences*, 10(2), 84–86.
- NAS (2014). *National Achievement Survey*, Ministry of Human Resource Development, New Delhi.
- Nguyen, H. T. M. (2019). Ethnic gaps in child education outcomes in Vietnam: an investigation using Young Lives data. *Education Economics*, 27(1), 93–111. <https://doi.org/10.1080/09645292.2018.1444147>
- Ojima, F., & Below, S. von. (2010). Family Background, School System and Academic Achievement in Germany and in Japan. In *Quality and inequality of education* (pp. 270–297). Springer. https://doi.org/DOI: 10.1007/978-90-481-3993-4_11
- Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review*, 14(3), 693–709.

- Okyere, M. (2019). Effects of school type and gender on student's self-concept and mathematics achievement. *Integrity Journal of Education and Training*, 3(1), 1–9. <https://doi.org/10.31248/ijet2019.032>
- Özpolat, A., & Yıldırım, M. (2009). In developing countries, relationship between women's education and growth. In *Anadolu International Conference in Economics*, 1–27. <https://doi.org/10.1080/0964529042000239140>
- Pandey, Dr. J. N. (2011). *The Constitutional Law of India*, 48th edition.
- Paul, P.K, Mondal, N. K. (2012). Impact of Mid-day Meal Programme on Academic Performance of Students: Evidence from few Upper Primary Schools of Burdwan District in West Bengal. *International Journal of Research in Social Sciences*, 2(3), 391–406.
- Paxson, C., & Schady, N. (2007). Cognitive development among young children in Ecuador: The roles of wealth, health, and parenting. *Journal of Human Resources*, 42(1), 49–84. <https://doi.org/10.3368/jhr.xlii.1.49>
- Pokropek, A., Borgonovi, F., & Jakubowski, M. (2015). Socio-economic disparities in academic achievement: A comparative analysis of mechanisms and pathways. *Learning and Individual Differences*, 42, 10–18. <https://doi.org/10.1016/j.lindif.2015.07.011>
- Pradhan Mantri Poshan Shakti Nirman (n.d.), Mid-Day Meal, Ministry of Education, Government of India. http://mdm.nic.in/mdm_website/
- Ratshivhanda, T. M., & Guvuriro, S. (2018). *An Inter-Generational Effect of Socio-Economic Status on Education Attainment in South Africa Thendo*. 10(4), 252–261.
- RMSA (n.d.), Rashtriya madhyamik shiksha abhiyan, Department of School Education & Literacy, Ministry of Human Resource Development, Government of India. <https://www.education.gov.in/en/rmsa>

- Rodríguez, S., Regueiro, B., Piñeiro, I., Estévez, I., & Valle, A. (2020). Gender Differences in Mathematics Motivation: Differential Effects on Performance in Primary Education. *Frontiers in Psychology*, 10(January), 1–8. <https://doi.org/10.3389/fpsyg.2019.03050>
- Saleh, S., & Rahman, M. A. A. (2016). A study of students' achievement in algebra: Considering the effect of gender and types of schools. *European Journal of STEM Education*, 1(1), 19–26. <https://doi.org/10.20897/lectito.201603>
- Sarmah, H. K., & Hazarika, B. B. (2012). An Analysis Of Students' Interest in Mathematics in Relation to Gender of Students and Type Of School. *International Journal of Mathematics Research*, 4(6), 707–725.
- Schultz, T. W. (1967). The Rate of Return in Allocating Investment Resources to Education. *The Journal of Human Resources*, 2(3), 293–309.
- Scott, J. (2004). Family , Gender , and Educational Attainment in Britain : A Longitudinal Study. *Journal of Comparative Family Studies*, 35(4), 565–589.
- Sen, K. M., & Kumar, A. K. S. (2001). Women in India how free ? how equal ? In *UNDAF*.
- Shanks, T. R. W. (2007). The impacts of household wealth on child development. *Journal of Poverty*, 11(2), 93–116. https://doi.org/10.1300/J134v11n02_05
- Siddiqui, A., & Ali, M. I. (2018). Influence of Study Habits on Academic Achievement of Senior Secondary School Students in relation to Gender and Community. *RESEARCH REVIEW International Journal of Multidisciplinary Secondary*, 3(2), 24–28.
- Singh, A. (2015). Private school effects in urban and rural India: Panel estimates at primary and secondary school ages. *Journal of Development Economics*, 113, 16–32. <https://doi.org/10.1016/j.jdeveco.2014.10.004>
- Singh, A., & Krutikova, S. (2017). Starting Together, Growing Apart: Gender Gaps in Learning from Preschool to Adulthood in Four Developing Countries. In *Working Paper* (Issue November). <http://repositorio.minedu.gob.pe/handle/MINEDU/5653>

- Singh, R., & Mukherjee, P. (2015). *Determinants of Successful Completion of Secondary Education Evidence from Young Lives, Andhra Pradesh*. www.younglives.org.uk
- Singh, R., & Mukherjee, P. (2019). Effect of preschool education on cognitive achievement and subjective wellbeing at age 12: evidence from India. *Compare*, 49(5), 723–741. <https://doi.org/10.1080/03057925.2018.1453349>
- Singh, S., Shekhar, C., Acharya, R., Moore, A. M., Stillman, M., Pradhan, M. R., Frost, J. J., Sahoo, H., Alagarajan, M., Hussain, R., Sundaram, A., Vlassoff, M., Kalyanwala, S., Browne, A., & Summary. (2018). The incidence of abortion and unintended pregnancy in, 2015. *The Lancet Global Health*, 6(1), e111–e120. [https://doi.org/10.1016/S2214-109X\(17\)30453-9](https://doi.org/10.1016/S2214-109X(17)30453-9)
- Samagra Shiksha (n.d.), Kasturba Gandhi Balika Vidyalya (KGBV), Department of School Education Literacy India, Ministry of Education, Government of India. <https://samagra.education.gov.in/kgbv.html>
- SSA. (2018). Annual Report 2018-19. In *Samagra Shiksha, Delhi*.
- SSA. (2019). Evaluation of Sarva Shiksha Abhiyan (SSA) Final Report. In *Ministry of Human Resources Development*. <http://globalforum.items-int.com/gf/gf-content/uploads/2019/06/ssaevaluationreportmarch2019.pdf>
- Steelman, L. C., & Powell, B. (1989). Acquiring Capital for College : The Constraints of Family Configuration. *American Journal of Sociology*, 54(5), 844–855.
- Steelman, L. C., & Powell, B. (1991). Sponsoring the Next Generation: Parental Willingness to Pay for Higher Education. *American Journal of Sociology*, 96(6), 1505–1529. <https://doi.org/10.1086/229695>
- Stevenson, D. L., & Baker, D. P. (1987). The Family-School Relation and the Child's School Performance. *Child Development*, 58(5), 1348–1357. <https://doi.org/DOI: 10.1111/j.1467-8624.1987.tb01463.x>

- Stumm, S. von. (2017). Socioeconomic status amplifies the achievement gap throughout compulsory education independent of intelligence. *Intelligence*, 60, 57–62. <https://doi.org/10.1016/j.intell.2016.11.006>
- Tafere, Y., & Tiumelissan, A. (2020). Working Paper Slow Progression : Educational Trajectories of Young Men and Women in Ethiopia Yisak Tafere and Agazi Tiumelissan. In *Young Lives*.
- Taiwo, A. A. (2011). *Impact of Financial Aids on Students Academic Performamnce*. <https://www.academia.edu/8502544/>
- Teachman, J. A. Y. D. (1987). Family Background, Educational Resources, and Educational Attainment. *American Sociological Review*, 52(4), 548–557.
- Thomson, S. (2018). Achievement at school and socioeconomic background—an educational perspective. *Npj Science of Learning*, 3(5). <https://doi.org/https://doi.org/10.1038/s41539-018-0022-0>
- Vegas, E., & Coffin, C. (2015). When education expenditure matters: An empirical analysis of recent international data. *Comparative Education Review*, 59(2), 289–304. <https://doi.org/10.1086/680324>
- Venniker, R. (2000). Social returns to education: a survey of recent literature on human capital externalities. *CPB Netherlands Bureau for Economic Policy*, 1, 47–50. <http://www.tilburguniversity.edu/research/institutes-and-research-groups/center/staff/smolders/gtlit/vennik00.pdf>
- White, H., Ruther, M., & Kahn, J. (2016). Educational Inequality in India: An Analysis of Gender Differences in Reading and Mathematics. *Journal of Research in Gender Studies*, 6(2), 153–182. <https://doi.org/10.22381/jrgs62201610>
- Witte, J. F. (1992). Private school versus public school achievement: Are there findings that should affect the educational choice debate? *Economics of Education Review*, 11(4), 371–394. [https://doi.org/10.1016/0272-7757\(92\)90043-3](https://doi.org/10.1016/0272-7757(92)90043-3)

- Woldehanna, T., & Gebremedhin, A. (2016). Learning Outcomes of Children Aged 12 in Ethiopia: A Comparison of Two Cohorts. In *Young Lives*. www.younglives.org.uk
- Woo, H., Sakamoto, A., & Takei, I. (2012). Beyond the Shadow of White Privilege?: The Socioeconomic Attainments of Second Generation South Asian Americans. *Sociology Mind*, 02(01), 23–33. <https://doi.org/10.4236/sm.2012.21003>
- Woodhead, M., Frost, M., & James, Z. (2013). Does growth in private schooling contribute to Education for All? Evidence from a longitudinal, two cohort study in Andhra Pradesh, India. *International Journal of Educational Development*, 33(1), 65–73. <https://doi.org/10.1016/j.ijedudev.2012.02.005>
- Young Lives: An International Study of Childhood Poverty. (2017). *Education and Learning in Telangana: Preliminary Finding from the 2016 Young Lives Survey (Round 5)*.
- Young Lives Survey. (2017). *Education and learning: preliminary findings from the 2016 Young Lives Survey (round 5): United Andhra Pradesh*.
- Zhan, M. (2006). Assets, parental expectations and involvement, and children's educational performance. *Children and Youth Services Review*, 28(8), 961–975. <https://doi.org/10.1016/j.childyouth.2005.10.008>

APPENDIX

Appendix: Chapter-I

Table A1.1: All India Gender Wise Arithmetic Level (In %)

Year	Gender	Nothing	Number		Subtraction	Division	Total
			1 to 9	11 to 99			
2010	All	7.59	15.39	19.67	21.54	35.81	100
	Male	7.42	15.17	19.31	21.35	36.75	100
	Female	7.79	15.66	20.10	21.77	34.69	100
2014	All	10.70	18	27.40	18.60	25.30	100
	Male	10.60	16.90	27.50	18.30	26.80	100
	Female	10.70	19.20	27.20	19	23.90	100

Source: ASER, 2010, 2014, India.

Table A1.2: All India School Wise Arithmetic Level (In %)

Year	Gender	Nothing	Number		Subtraction	Division	Total
			1 to 9	11 to 99			
2010	All	7.59	15.39	19.67	21.54	35.82	100
	Govt.	8.17	16	20.03	21.85	33.96	100
	Private	5.50	13.44	18.65	20.87	41.53	100
2014	All	10.60	18	27.40	18.60	25.30	100
	Govt.	12.70	20.10	27.10	17.80	22.40	100
	Private	6	13.60	28	20.50	31.80	100

Source: ASER, 2010, 2014, India.

Table A1.3: All India Gender Wise Reading Level (In %)

Year	Gender	Nothing	Letter	Word	Paragraph		Total
					Standard 1	Standard 2	
2010	All	7.67	14.36	14.52	16.05	47.41	100
	Female	7.81	14.34	14.49	15.95	47.42	100
	Male	7.55	14.37	14.53	16.14	47.40	100
2014	All	13.50	15.60	12	12.80	46.10	100
	Female	13.30	15.60	11.50	12.10	47.50	100
	Male	13.70	15.70	12.40	13.50	44.80	100

Source: ASER, 2010, 2014, India.

Table A1.4: All India School Wise Reading Level (In %)

Year	Type of School	Nothing	Letter	Word	Paragraph		Total
					Standard 1	Standard 2	
2010	All	7.67	14.36	14.51	16.05	47.41	100
	Govt.	8.21	14.57	15.12	16.84	45.26	100
	Private	5.67	13.48	12.80	13.91	54.14	100
2014	All	13.50	15.60	12	12.80	46.10	100
	Govt.	15.80	16.40	12.10	12.80	43	100
	Private	8.10	14.10	11.80	12.90	53.20	100

Source: ASER, 2010, 2014, India.

Table A1.5: Gender Wise Arithmetic Level for the Erstwhile Andhra Pradesh (In %)

Year	Gender	Nothing	Number		Subtraction	Division	Total
			1 to 9	11 to 99			
2010	All	4.02	10.02	23.33	23.88	38.76	100
	Male	3.73	9.67	23.10	23.80	39.71	100
	Female	4.30	10.36	23.55	23.96	37.83	100
2014	All	8	8.10	30.30	25	28.60	100
	Male	7.80	7.80	29.80	26.20	28.50	100
	Female	8.30	8.30	30.80	23.80	28.80	100

Source: ASER, 2010, 2014, Andhra Pradesh.

Table A1.6: School wise Arithmetic level for Erstwhile Andhra Pradesh (In %)

Year	Type of School	Nothing	Number		Subtraction	Division	Total
			1 to 9	11 to 99			
2010	All	4.02	10.02	23.33	23.88	38.76	100
	Govt.	4.06	9.51	21.73	24.46	40.23	100
	Private	3.94	10.87	25.99	22.97	36.24	100
2014	All	8	8.10	30.30	25	28.60	100
	Govt.	8.80	8	27.90	25.70	29.70	100
	Private	6.70	8.10	34.20	24.10	27	100

Source: ASER, 2010, 2014, Andhra Pradesh.

Table A1.7: Gender Wise Reading Level for Erstwhile Andhra Pradesh (In %)

Year	Gender	Nothing	Letter	Word	Paragraph		Total
					Standard 1	Standard 2	
2010	All	4.67	12.98	14.91	15.43	52.02	100
	Female	4.45	12.09	14.67	15.02	53.76	100
	Male	4.89	13.85	15.15	15.82	50.30	100
2014	All	10.50	13.10	15.30	14.50	46.60	100
	Female	9.80	12.80	14.40	13.80	49.20	100
	Male	11.20	13.50	16.10	15.20	44.10	100

Source: ASER, 2010, 2014, Andhra Pradesh.

Table A1.8: School Wise Reading Level for Erstwhile Andhra Pradesh (In %)

Year	Type of School	Nothing	Letter	Word	Paragraph		Total
					Standard 1	Standard 2	
2010	All	4.67	12.98	14.91	15.43	52.02	100
	Govt.	4.99	11.38	13.66	15.37	54.59	100
	Private	4.12	15.63	16.96	15.49	47.81	100
2014	All	10.50	13.10	15.30	14.50	46.60	100
	Govt.	11.40	11.90	13.70	13.50	49.50	100
	Private	8.90	15.20	17.80	16.10	42	100

Source: ASER, 2010, 2014, Andhra Pradesh.

Table A1.9: Class Wise Reading Level for All India, 2014 (In %)

Class	Nothing	Letter	Word	Paragraph		Total
				Standard 1	Standard 2	
All	15.10	17.80	13.80	14.30	38.90	100
1	48.60	30.20	12.10	4.50	4.50	100
2	25.70	31.60	19.60	11	12.20	100
3	14.90	25	20	16.60	23.60	100
4	8.40	17.50	17.90	18.90	37.40	100
5	5.70	12.80	14.30	19.10	48.10	100
6	3.50	9	10.90	17.80	58.80	100
7	2.60	6.20	8.10	15.40	67.70	100
8	1.80	4.50	6.20	12.80	74.60	100

Source: ASER, 2010, 2014, India.

Table A1.10: Class Wise Arithmetic Level for All India, 2014 (In %)

Class	Nothing	Number		Subtraction	Division	Total
		1 to 9	11 to 99			
All	11.80	20.80	29	18.60	19.70	100
1	42.40	33.80	19.30	3.40	1.10	100
2	19.50	36.50	31.20	9.90	2.80	100
3	10	29.40	35.30	18	7.30	100
4	5.30	21.20	33.30	24.10	16.10	100
5	3.90	15.40	30.10	24.50	26.10	100
6	2.30	10.50	29.20	25.80	32.20	100
7	1.70	7.50	28.50	24.40	37.80	100
8	1.30	5.40	26.10	23.20	44.10	100

Source: ASER, 2010, 2014, India.

Table A1.11: Class Wise Reading Level for Erstwhile Andhra Pradesh, 2104 (In %)

Type of School	Nothing	Letter	Word	Paragraph		Total
				Standard 1	Standard 2	
All	9.30	13.40	18.10	17.40	41.80	100
1	37.50	32.60	23.80	4.50	1.60	100
2	16.40	25.70	31.40	15.80	10.70	100
3	7	18.70	28	23.20	23.10	100
4	4.30	10.70	20.80	25.10	39.10	100
5	2	6.20	14.50	21	56.30	100
6	1.60	5.10	10.90	19.90	62.40	100
7	0.90	3.10	7.60	16.70	71.80	100
8	0.70	1.80	4.70	13.40	79.40	100

Source: ASER, 2010, 2014, Andhra Pradesh.

Table A1.12: Class Wise Arithmetic Level for Erstwhile Andhra Pradesh, 2014 (In %)

Class	Nothing	Number		Subtraction	Division	Total
		1 to 9	11 to 99			
All	6.70	7.90	33.60	26.90	24.90	100
1	30.90	25.10	41.50	2.10	0.40	100
2	10.40	17.90	53.80	16.60	1.30	100
3	4.30	8.40	49.40	32.10	5.80	100
4	2	4	36.40	38.10	19.50	100
5	1.30	2.40	24.90	35.30	36.20	100
6	0.90	1.50	23.20	31.40	43	100
7	0.60	0.60	18.50	31.90	48.40	100
8	0.30	0.40	17.30	30.10	51.80	100

Source: ASER, 2010, 2014, Andhra Pradesh.

Appendix: Chapter-VI

Table A6.1: The Regression Results for Mathematics Test Score

Variables	Mathematics Test Score					
	For the whole Sample		For male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	5.395	0.003***	-	-	-	-
Region	-6.494	0.001***	-3.780	0.251	-9.541	0.001***
Time to Study	0.335	0.784	3.987	0.030**	-1.843	0.243
Body Mass Index	-0.340	0.080*	-0.208	0.420	-0.456	0.164
Year of Education	0.920	0.079*	0.507	0.502	1.559	0.034**
SC	5.634	0.018**	6.734	0.093*	5.708	0.081*
OBC	8.146	0.002***	10.729	0.011**	6.805	0.058*
Mother's Education	0.137	0.561	0.286	0.380	-0.044	0.895
Father's Education	0.356	0.087*	0.104	0.731	0.411	0.172
Expenditure	-0.000	0.668	-0.000	0.423	0.000	0.421
Household Size	-2.782	0.000***	-1.987	0.040**	-3.596	0.003***
Assets	0.000	0.054*	-4.71e-07	0.981	0.000	0.013**
Type of School	-0.278	0.908	-0.675	0.877	1.720	0.522
Medium of Instruction	4.995	0.004***	3.592	0.184	5.760	0.021**
Availability of Fellowship	-1.424	0.442	0.772	0.807	-3.429	0.138
Mid-Day Meal	-1.536	0.588	-6.182	0.146	1.630	0.669
Constant	75.872	0.000	72.616	0.000	79.894	0.000
Number of obs.	270		137		133	
F	7.55 (16,253)		4.16 (15, 121)		4.75 (15,117)	
Prob.>F	0.0000		0.0000		0.0000	
R-squared	0.2805		0.2834		0.3218	
Root MSE	13.307		13.827		12.666	

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using primary survey data, 2021.

We checked for homoskedasticity using the Breuch-Pagan test, and we do not reject the null hypothesis of homoskedasticity for the whole sample and subsamples. We also checked for multicollinearity and found no evidence for the overall as well as subsamples.

Table A6.2: The Regression Results for English Test Score

Variables	English Test Score					
	For the whole Sample		For male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	4.937	0.012**	0		0	
Region	-6.575	0.002***	1.196	0.730	-12.552	0.000***
Time to Study	0.044	0.972	5.458	0.002***	-3.377	0.032**
Body Mass Index	-0.527	0.011**	-0.089	0.771	-0.944	0.002***
Year of Education	1.175	0.029**	0.479	0.523	1.841	0.014**
SC	5.245	0.045**	1.625	0.701	9.188	0.006***
OBC	5.337	0.055*	2.128	0.607	8.973	0.021**
Mother's Education	0.038	0.878	-0.020	0.953	-0.069	0.843
Father's Education	0.329	0.150	0.336	0.312	0.231	0.488
Expenditure	0.000	0.189	0.000	0.233	0.000	0.069*
Household Size	-20.200	0.015**	-2.134	0.049**	-2.252	0.116
Assets	0.000	0.155	-7.98e-06	0.700	0.000	0.005***
Type of School	-3.346	0.264	-0.885	0.849	-0.583	0.851
Medium of Instruction	3.816	0.039**	0.853	0.744	5.332	0.045**
Availability of Fellowship	-2.531	0.233	0.987	0.774	-4.262	0.126
Mid-Day Meal	1.479	0.668	-0.391	0.940	1.586	0.664
Constant	78.104	0.000	61.993	0.000	89.082	0.000
Number of obs.	270		137		133	
F	5.00 (16,253)		2.93 (15, 121)		7.37 (15,117)	
Prob.>F	0.0000		0.0000		0.0000	
R-squared	0.2187		0.2270		0.3548	
Root MSE	14.36		14.088		13.745	

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using primary survey data, 2021.

Note: We checked for homoskedasticity using the Breuch-Pagan test, and we do not reject the null hypothesis of homoskedasticity for the whole sample and subsamples. We also checked for multicollinearity and found no evidence for the overall as well as subsamples.

Table A6.3: The Regression Results for Social Science Test Score

Variables	Social Science Test Score					
	For the whole Sample		For male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	5.964	0.001***	0		0	
Region	-2.737	0.182	1.587	0.618	-5.136	0.054*
Time to Study	0.819	0.469	3.010	0.089*	-1.093	0.427
Body Mass Index	-0.164	0.454	0.402	0.186	-0.763	0.008***
Year of Education	0.885	0.078*	0.676	0.317	1.131	0.095*
SC	4.592	0.066*	4.041	0.336	6.687	0.041**
OBC	3.562	0.165	2.914	0.466	7.351	0.053*
Mother's Education	0.139	0.542	-0.238	0.480	0.240	0.435
Father's Education	0.411	0.057*	0.946	0.007***	0.019	0.943
Expenditure	-0.000	0.809	0.000	0.215	-0.000	0.227
Household Size	-2.114	0.021**	-1.814	0.115	-2.519	0.057*
Assets	0.000	0.032**	0.000	0.197	0.000	0.011**
Type of School	-5.424	0.042**	-12.016	0.000***	2.584	0.385
Medium of Instruction	0.827	0.651	-2.412	0.376	3.477	0.168
Availability of Fellowship	0.075	0.970	-1.020	0.731	1.896	0.433
Mid-Day Meal	0.635	0.832	6.329	0.056*	-4.709	0.212
Constant	70.136	0.000	56.583	0.001	82.905	0.000
Number of obs.	270		137		133	
F	4.96 (16,253)		5.25 (15, 121)		3.06 (15,117)	
Prob.>F	0.0000		0.0000		0.0003	
R-squared	0.2012		0.2717		0.2543	
Root MSE	13.735		13.928		12.576	

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using primary survey data, 2021.

Note: We checked for homoskedasticity using the Breuch-Pagan test, and we do not reject the null hypothesis of homoskedasticity for the whole sample and subsamples. We also checked for multicollinearity and found no evidence for the overall as well as subsamples.

Table A6.4: The Regression Results for Science Test Score

Variables	Science Test Score					
	For the whole Sample		For male		For Female	
	Coefficient	p values	Coefficient	p values	Coefficient	p values
Gender	4.011	0.034**	0		0	
Region	-4.130	0.060*	-0.439	0.900	-7.375	0.008***
Time to Study	0.710	0.570	2.261	0.277	-0.647	0.672
Body Mass Index	-0.279	0.206	0.097	0.751	-0.674	0.030**
Year of Education	1.121	0.043**	1.606	0.055*	0.846	0.226
SC	5.106	0.032**	4.840	0.202	7.636	0.020**
OBC	5.482	0.028**	4.085	0.267	10.383	0.008***
Mother's Education	0.103	0.664	-0.025	0.945	0.028	0.927
Father's Education	0.209	0.353	0.821	0.022**	-0.219	0.425
Expenditure	-0.000	0.802	-0.000	0.518	9.27e-07	0.988
Household Size	-2.905	0.001***	-3.483	0.003***	-2.437	0.047**
Assets	0.000	0.064*	0.000	0.355	0.000	0.006***
Type of School	-2.983	0.305	-9.190	0.047**	4.426	0.206
Medium of Instruction	0.121	0.949	-3.368	0.227	2.029	0.446
Availability of Fellowship	-0.718	0.746	-3.766	0.307	1.936	0.461
Mid-Day Meal	-1.634	0.626	-0.977	0.840	-4.521	0.284
Constant	76.773	0.000	69.304	0.000	85.015	0.000
Number of obs.	270		137		133	
F	4.23 (16,253)		4.04 (15, 121)		3.10 (15,117)	
Prob.>F	0.0000		0.0000		0.0003	
R-squared	0.1725		0.2304		0.2352	
Root MSE	14.685		15.177		13.637	

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using primary survey data, 2021.

Note: We checked for homoskedasticity using the Breuch-Pagan test, and we do not reject the null hypothesis of homoskedasticity for the whole sample and subsamples. We also checked for multicollinearity and found no evidence for the overall as well as subsamples.

Table A6.5: Descriptive Statistics for Male Students of Mancherla and Prakasham District

Variable	N	Mean	Median	Min.	Max.	Std. Dev.	Skewness	kurtosis
Overall Avg. Test Score	137	72.334	72.5	36.25	100	13.627	-0.039	2.468
Mathematics Test Score	137	72.372	70	30	100	15.407	-0.063	2.391
English Test Score	137	71.876	70	35	100	15.114	-0.065	2.440
Social Science Test Score	137	73.613	75	35	100	15.393	-0.239	2.576
Science Test Score	137	71.474	70	35	100	16.318	-0.062	2.297
Region	137	0.474	0	0	1	0.501	0.102	1.010
Time to Study	137	2.084	2	1	4	0.810	0.018	1.888
Body Mass Index	137	19.213	18.593	11.347	33.118	4.127	0.672	3.270
Year of Education	137	9.022	9	6	12	1.892	-0.012	1.827
SC	137	0.547	1	0	1	0.500	-0.191	1.036
ST	137	0.131	0	0	1	0.339	2.182	5.762
OBC	137	0.321	0	0	1	0.469	0.766	1.587
Mother's Education	137	4.423	4	0	15	4.561	0.602	2.152
Father's Education	137	5.701	5	0	17	5.011	0.346	1.913
Expenditure	137	5096.504	0	0	95000	12408.67	3.886	23.274
Household Size	137	4.431	4	1	10	1.097	1.100	7.737
Assets	137	67984.67	55500	4000	644000	85358.39	3.935	21.874
Type of School	137	0.832	1	0	1	0.375	-1.777	4.158
Medium of Instruction	137	0.657	1	0	1	0.476	-0.661	1.437
Availability of Fellowship	137	0.387	0	0	1	0.489	0.465	1.216
Mid-Day Meal	137	0.810	1	0	1	0.394	-1.582	3.503

Source: Author's own interpretation using Primary Survey data, 2021.

Table A6.6: Descriptive Statistics for Female Students of Mancherial and Prakasham District

Variable	N	Mean	Median	Min.	Max.	Std. Dev.	Skewness	kurtosis
Overall Avg. Test Score	133	67.049	67.5	32.5	100	13.018	0.084	3.385
Mathematics Test Score	133	66.534	65	35	100	14.481	0.135	2.982
English Test Score	133	67.241	65	20	100	16.110	-0.186	2.879
Social Science Test Score	133	67.278	65	35	100	13.711	0.255	3.204
Science Test Score	133	67.143	65	30	100	14.681	0.043	2.967
Region	133	0.564	1	0	1	0.500	-0.258	1.066
Time to Study	133	1.684	1.5	0	5	.871	1.148	4.739
Body Mass Index	133	19.519	19.471	10.880	31.000	4.052	0.487	3.306
Year of Education	133	9.173	9	6	12	1.889	-0.115	1.888
SC	133	0.391	0	0	1	0.490	0.447	1.200
ST	133	0.211	0	0	1	0.409	1.420	3.017
OBC	133	0.398	0	0	1	0.491	0.415	1.172
Mother's Education	133	4.195	3	0	15	4.267	0.650	2.301
Father's Education	133	5.737	5	0	15	4.956	0.285	1.909
Expenditure	133	8612.406	0	0	172000	22929.17	4.160	24.902
Household Size	133	4.511	4	2	7	0.934	0.610	4.029
Assets	133	62952.63	51200	3500	649000	96512.7	4.458	24.639
Type of School	133	0.744	1	0	1	0.438	-1.120	2.255
Medium of Instruction	133	0.586	1	0	1	0.494	-0.351	1.123
Availability of Fellowship	133	0.331	0	0	1	0.472	0.719	1.517
Mid-Day Meal	133	0.805	1	0	1	0.398	-1.536	3.358

Source: Author's own interpretation using Primary Survey data, 2021.

Table A6.7: Detailed Blinder-Oaxaca Decomposition for Mathematics Test Score

	Mathematics Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Region	0.022	0.361	0.180	0.180	0.034	0.320
Time to study	-0.105	0.044	-0.799	0.008***	0.153	0.027**
Body Mass Index	-0.004	0.648	-0.312	0.557	-0.005	0.671
Years of Education	0.005	0.620	0.623	0.255	0.010	0.570
SC	-0.069	0.146	-0.037	0.837	0.011	0.838
OBC	0.055	0.236	-0.083	0.462	-0.020	0.519
Mother's Education	-0.004	0.704	-0.096	0.457	0.005	0.712
Father's Education	0.000	0.953	0.115	0.460	0.001	0.953
Expenditure on Education	-0.028	0.467	0.053	0.344	0.036	0.412
Household Size	-0.011	0.543	-0.469	0.350	-0.009	0.593
Assets	0.000	0.976	0.143	0.134	-0.011	0.664
Type of School	0.004	0.898	0.131	0.718	-0.014	0.724
Medium of Instruction	-0.017	0.380	0.094	0.557	-0.010	0.598
Availability of Fellowship	-0.003	0.815	-0.107	0.322	0.015	0.490
Mid-Day Meal	0.002	0.906	0.416	0.256	-0.003	0.906
Total (N= 130)	-0.152	0.115	-0.427	0.001	0.195	0.065

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using Primary Survey data, 2021.

Table A6.8: Detailed Blinder-Oaxaca Decomposition for English Test Score

	English Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Region	-0.007	0.725	0.414	0.003***	0.078	0.184
Time to study	-0.138	0.014	-1.169	0.000***	0.224	0.006***
Body Mass Index	-0.002	0.797	-1.043	0.053*	-0.017	0.557
Years of Education	0.005	0.632	0.780	0.161	0.013	0.552
SC	-0.016	0.682	0.263	0.151	-0.075	0.207
OBC	0.010	0.629	0.140	0.224	0.034	0.368
Mother's Education	0.000	0.954	-0.014	0.915	0.001	0.918
Father's Education	0.001	0.953	-0.038	0.808	-0.000	0.954
Expenditure on Education	0.034	0.393	-0.024	0.665	-0.016	0.675
Household Size	-0.011	0.540	-0.033	0.948	-0.001	0.948
Assets	0.003	0.738	0.181	0.064*	-0.013	0.659
Type of School	0.005	0.869	0.016	0.965	-0.002	0.965
Medium of Instruction	-0.004	0.769	0.187	0.248	-0.020	0.406
Availability of Fellowship	-0.004	0.773	-0.129	0.239	0.019	0.456
Mid-Day Meal	0.000	0.949	0.102	0.784	-0.001	0.913
Total (N= 130)	-0.124	0.172	-0.394	0.003	0.223	0.060

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using Primary Survey data, 2021.

Table A6.9: Detailed Blinder-Oaxaca Decomposition for Social Science Test Score

	Social Science Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Region	-0.010	0.644	0.214	0.119	0.040	0.282
Time to study	-0.081	0.108	-0.574	0.060*	0.110	0.090
Body Mass Index	0.008	0.578	-1.503	0.006***	-0.024	0.548
Years of Education	0.007	0.583	0.276	0.622	0.005	0.693
SC	-0.042	0.332	0.097	0.597	-0.028	0.605
OBC	0.015	0.527	0.096	0.407	0.023	0.480
Mother's Education	0.004	0.716	0.142	0.284	-0.007	0.693
Father's Education	0.002	0.953	-0.355	0.028**	-0.002	0.953
Expenditure on Education	0.031	0.431	-0.066	0.250	-0.046	0.345
Household Size	-0.010	0.548	-0.210	0.682	-0.004	0.729
Assets	-0.006	0.674	0.102	0.295	-0.008	0.677
Type of School	0.071	0.163	0.815	0.029**	-0.086	0.169
Medium of Instruction	0.011	0.483	0.260	0.113	-0.028	0.340
Availability of Fellowship	0.004	0.764	0.076	0.491	-0.011	0.576
Mid-Day Meal	-0.002	0.906	-0.600	0.109	0.004	0.906
Total (N= 130)	0.003	0.980	-0.367	0.006	-0.061	0.617

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using Primary Survey data, 2021.

Table A.10: Detailed Blinder-Oaxaca Decomposition for Science Test Score

	Science Test Score					
	Endowment Effect		Coefficient Effect		Interaction Effect	
	Coefficient	P value	Coefficient	P value	Coefficient	P value
Region	0.003	0.902	0.210	0.139	0.040	0.295
Time to study	-0.058	0.246	-0.387	0.220	0.074	0.242
Body Mass Index	0.002	0.795	-0.945	0.093*	-0.015	0.563
Years of Education	0.015	0.530	-0.438	0.449	-0.007	0.620
SC	-0.048	0.294	0.098	0.608	-0.028	0.614
OBC	0.020	0.448	0.129	0.280	0.031	0.400
Mother's Education	0.000	0.946	0.015	0.912	-0.001	0.915
Father's Education	0.002	0.953	-0.379	0.023**	-0.002	0.953
Expenditure on Education	-0.028	0.488	0.040	0.490	0.028	0.524
Household Size	-0.018	0.526	0.296	0.576	0.005	0.671
Assets	-0.007	0.672	0.096	0.337	-0.007	0.682
Type of School	0.052	0.236	0.724	0.060*	-0.076	0.198
Medium of Instruction	0.015	0.416	0.226	0.181	-0.024	0.373
Availability of Fellowship	0.013	0.475	0.141	0.219	-0.020	0.448
Mid-Day Meal	0.000	0.922	-0.183	0.636	0.001	0.909
Total (N= 130)	-0.036	0.719	-0.239	0.077	-0.002	0.986

Note: *p<.1, **p<.05, ***p<.01.

Source: Author's own interpretation using Primary Survey data, 2021.



School of Economics
University of Hyderabad
Prof. C. R. Rao Road, P O Central University
Hyderabad, Telangana 500046



Survey Questionnaire on “Gender Gap in Educational Performance among Marginalised Groups: A Study of Andhra Pradesh and Telangana”

*My name is **KULDEEP SINGH NAGI** and I am from university of Hyderabad, pursuing Ph.D. Economics and working on “Gender Gap in Educational Performance among Marginalised Groups: A study of Andhra Pradesh and Telangana”. The findings of this survey will be strictly used for the academic purposes. This survey is an independent study and is not linked to any private organization or agency. Information gathered will be kept strictly confidential. Participation in this study is voluntary and it is entirely up to you to answer or not any question that I ask. I hope that you will take part in this survey since your participation is important. It usually take 10 to 15 minutes to complete this interview. Please spare some time for the interview and help me in successfully completing the survey.*

Descriptive Identification of Household Sample					
Item no.	Item	Code	Item no.	Item	Code
1	State		2	District	
3	Sub-District/Tehsil/Town/Mandal		4	Location	
5	Village Name:				

CODES

Item 1: State: Andhra Pradesh-1, Telangana-2

Item 3 : Sub-District/Tehsil/Mandal

Item 2: District: Prakasham-1, Mancharia-2

Item 4: Location : Rural-1, Urban-2

Household Characteristics					
Item no.	Item	Code	Item no.	Item	Code
1	Household Size		4	Language Spoken at Household	
2	Religion		5	Whether the household has a computer [#]	
3	Social Groups		6	Whether the household has internet	
7	Whether the household has study table		8	Availability of separate space to study	
9	Household Income (in Rs)				
10	Household expenditure on Consumption (in Rs)				
[#] Computer includes desktop, laptop, notebook, tablets, etc.					

CODES

Item 2: Religion: Hinduism-1, Islam-2, Christianity-3, Sikhism-4, Janism-5, Buddhism-6, Others-9

Item 3: Social Groups: Scheduled Tribe-1, Scheduled Caste-2, Other Backward Class-3, Others-9

Item 4: Language: Telague-1, Hindi-2, English-3

Item 5: Computer in Household: Yes-1, No-2

Item 6: Internet in Household: Yes-1, No-2

Item 7: Study table in Household: Yes-1, No-2

Item 8: Separate space for study in household: Yes-1, No-2

Parental Qualification and Involvement			
1	2	3	4
S.No	Item	Mother	Father
1	Highest schooling received		
2	Do you help children in doing home work		
3	Are you working		
4	Do you visit child's school regularly		
5	Occupation		

CODES

Item 2: Help in Homework: Yes-1, No-2

Item 3: Working status: Yes-1, No-2

Item 4: School Visit: Yes-1, No-2

Item 5: Occupation: Govt. Job-1, Daily Wage Worker—2, Farmer-3, others-4, House Wife-0

Demographic and Other Particulars of the Children											
1	2	3	4	5	6	7	8	9			
S. No	Name	Gender	Age	Weight	Height	If Taking Private Coaching	Years of Education	Marks scored in previous exam for the subject			
								Math	English	Social Science	Science
1											
2											
3											
4											
5											

CODES**Item 3: Gender:** Male-1, Female-2, Others-3**Item 7: If child is taking private coaching:** Yes-1, No-2**Item 8: Years of Education:** From class 1 to 12 -1 to 12 respectively**Item 9: Marks:** Marks Secured in previous standard in particular subject in state/CBSE board

School infrastructure											
1	2	3	4	5	6	7	8	9			
S. No	Name	Type of School	Age of Joining		Distance	Time	Medium of Instruction	Infrastructure			
								Toilet	Board	Desk	Drinking water
1											
2											
3											
4											
5											

CODES**Item 3: Type of School:** Private-1, Public (Govt)-2, NGO/Charity/religious-3, Charitable trust-4 **Item 4: Age of Joining:** At what age child has joined school.**Item 6: Distance:** Distance of school from house in Kms**Item 7: Time:** Time spent by child commuting school (up and down) in hrs**Item 8: Medium of Instruction:** Telague-1, Englis-2, Hindi-3, Others-4**Item 9: If the following infrastructure is available at school:** Yes-1, No-2

Expenditure on Education								
S.No	Name	Expenditure (in Rs)						
		1	2	3	4	5	6	7
		Course Fee	Books and Stationary	Uniform	Transportation	Private Coaching	Others	Total
1								
2								
3								
4								
5								

NOTE:

Annual Expenditure on Item 1, 2, 3, 4, 5, 6.

Item 1: Course Fee: including tuition fee, examination fee, development fee and other Compulsory payments.

Fellowship/Scholarship								
S.No	Name	1	2	3	4	5	6	7
		Availability of Fellowship	Amount (in Rs)	Fellowship on Time	Free Books and Stationary	Uniform	Availability of Mid-day meal	Provision of Egg in Mid-day meal
1								
2								
3								
4								
5								

CODES

Item 1: Whether child is receiving any fellowship/Scholarship: Yes-1, No-2

Item 3: Whether child is receiving fellowship on time: Yes-1, No-2

Item 5: Whether child is receiving Uniform: Yes-1, No-2

Item 7: If child is getting egg in mid-day meal: Yes-1, no-2

Item 2: If Item 1= yes, amount of fellowship

Item 4: Whether child is receiving free stationary: Yes-1, No-2

Item 6: Whether child is receiving Mid-day meal: Yes-1, No-2

How much time you spent in the following activities during a typical day (i.e. Not a weekend or holiday?) (in hrs)											
S.No	Name	1	2	3	4	5	6	7	8	9	10
		Sleep	Care for others	Domestic work	Work on family farm/business	Paid work for others	At School	Study apart from school	Play time/ leisure	Commuting time	
1											
2											
3											
4											
5											

CODES

Item 1: Duration of sleep child take.

Item 2: Time spent on care for others (younger siblings, ill household members)

Item 3: Domestic Task such as bringing water, firewood, cleaning, shopping, etc.

Item 4: Work on family farm, Cattle herding, family business, and handicraft done at home.

Item 5: Paid work outside household (including travelling time, out and return).

Item 6: At school/Institution (only time spent on attending classes).

Item 7: Studying outside of school time (at home, extra tuition).

Item 8: Play time/ leisure (including eating, self-hygiene).

Item 9: Time spent commuting to school/educational institute (out and return)

Details of five most valuable assets available at house.								
S.No.	Name	Assets Owned						Total
			A1	A2	A3	A4	A5	
1		Item Code						
		Value@						
2		Item Code						
		Value						
3		Item Code						
		Value						
4		Item Code						
		Value						
5		Item Code						
		Value						

@ If you were to sell it today, how much could you get?

CODES

AGRICULTURAL ASSETS

01=Agricultural tools (e.g. sickle, crowbar, shovels)

05=Pump (motor or engine), including pipe

NON-AGRICULTURAL ASSETS

09=Barber tools (scissors, mirror, etc.)

12=Cleaning/domestic work equipment (mop, iron, etc.)

14=Entertainment equipment (musical instruments, speakers, lighting, karaoke machine, etc.)

15=Food preparation equipment (portable stove, serving bowls, etc.)

16=Gun

19=Pottery equipment (kiln, potters wheel, etc.)

22=Teaching supplies (books, blackboard, etc.)`

24=Trading license (e.g. for market stall)

30=Other, specify

02=Cart/ wheelbarrow

06=Thresher, harvester

10=Beauty salon equipment (hair dryer, etc.)

13=Construction tools (electrical tools, carpentry tool box, etc.)

17=Mechanic equipment (jack, tires, jumper cables, etc)

20=Protective clothing (overalls, steel-toed boots, hardhat, etc.)

23=Trading equipment (display table, weighing machine, money box, grinder, etc.)

25=Transport (minibus, car, motorbike, bicycle, etc.)

31=NK

03=Pesticide sprayer

07=Tractor (with all accessories)

32=Refused to answer

04=Plough

08=Other farm equipment

11=Blacksmith tools

18=Plumbing equipment

21=Sewing machine

26=Weaving equipment (loom, etc.)

33=N/A

Gender Gap in Academic Performance in Public and Private Schools: An Analysis of Young Lives Survey for India

Kuldeep Singh Nagi^{*} and Gummadi Sridevi

*School of Economics, University of Hyderabad
Hyderabaad, India*

Abstract: Using the Young Lives longitudinal sample of older cohorts for India, this study analyses which type of school has a more significant gender gap in educational performance and what variables are causing this gender gap. Regression result shows that the gender gap in educational performance is more in public school. Expenditure on education and mother's education influence performance for both type of school. Social background and time spent on study affect the performance of the private school children. The majority of the learning outcome gap based on gender, using the Blinder-Oaxaca method, is due to the coefficient effect for both public and private school children. The difference between the average features of the children does not explain the learning outcome gap.

Keywords: Gender, Performance gap, Parental education, Social background, Type of School

JEL Classification Number: I20, I21, I22, I24, I28, I29

1. Introduction

Developed or developing, a nation fundamentally considers education as an essential pointer just as a base of economic and social development (UNDP, 2015). Therefore, it has become an issue of discussion and conversation among policymakers. Education is acknowledged as a significant measure and one of the essential methods for uplifting women. Data shows that 23.5% of the 6-14 years old children enrolled in school are in private schools (ASER, 2008).

Most researchers identify gender as a significant factor in children's academic achievement. For instance, in Australia, the gender gap prevails in educational performance (Collin et al., 2000). Males perform better irrespective of the type of school (Kingdon, 1996) and score higher in reading and mathematics (White et al., 2016). The National Achievement Survey (NAS-2014) shows critical contrast across states in the average level of students' performance. The report of NAS-2014 exhibits that the gender-based distinction gap is noticeable for the province of Andhra Pradesh in instructive accomplishment.

^{*} ^{*}Corresponding Author: Email: kuldeep@uohyd.ac.in

❖ Dedicated to 550th Birth Anniversary of Guru Nanak Dev Ji ❖

23rd Annual Conference of Indian Political Economy Association (IPEA)

Organised by

Department of Economics

Punjabi University, Patiala &

Indian Political Economy Association

on

Political Economy of Nexus between State, Big Corporations and Development in India

This is to certify that Mr./Mrs./Ms./Dr./Prof...Kuldeep...Singh...Nagi.....

.....has Participated / Presented a paper entitled
Gender...and...educational...performance:..Analysis..of..young..lives..survey..data..for..India
during the 23rd Annual Conference of Indian Political Economy Association (IPEA), held on
November 8-9, 2019 at Punjabi University, Patiala, Punjab, India.


(Dr. Jasdeep Singh Toor)

Organizing Secretary


(Dr. Sarbjeet Singh)

Organizing Secretary


(Dr. Balwinder Singh Tiwana)

Convenor & Head



56th

ANNUAL CONFERENCE OF THE INDIAN ECONOMETRIC SOCIETY (TIES)



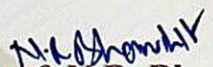
Madurai Kamaraj University

8 - 10 January 2020

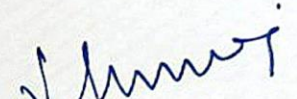
CERTIFICATE

This is to certify that Mr/Ms/Dr. Kuldeep Singh Nagi.....of
University of Hyderabad, Hyderabad, Telangana.....presented a research paper
entitled Gender Based Analysis of Educational Performance: Evidences From Young Lives
Survey data, India
in the **56th Annual Conference of The Indian Econometric Society (TIES)**
held during 08 - 10 January 2020, organized by School of Economics,
Madurai Kamaraj University, Madurai, Tamil Nadu, India.




Prof. N.R. Bhanumurthy
Secretary, TIES


Prof. D. Swamikannan
Local President


Dr. S. Pushparaj
Local Organising Secretary

Gender Gap in Educational Performance among Marginalised Groups: A Study of Andhra Pradesh and Telangana

by Kuldeep Singh Nagi

Submission date: 06-Jan-2022 05:47PM (UTC+0530)

Submission ID: 1738094648

File name: Kuldeep_Singh_Nagi.docx (2.5M)

Word count: 63130

Character count: 344151

Gender Gap in Educational Performance among Marginalised Groups: A Study of Andhra Pradesh and Telangana

ORIGINALITY REPORT

8%

SIMILARITY INDEX

6%

INTERNET SOURCES

4%

PUBLICATIONS

2%

STUDENT PAPERS

PRIMARY SOURCES

1

mafiadoc.com

Internet Source

1%

2

www.younglives.org.uk

Internet Source

<1%

3

library.uniglobe.edu.np

Internet Source

<1%

4

hdl.handle.net

Internet Source

<1%

5

Aquib Parvez, K. Laxminarayana.
"Mathematics learning inequality among
children of private and public schools", Asia
Pacific Education Review, 2021

Publication

<1%

6

www.slideshare.net

Internet Source

<1%

7

ojs.amhinternational.com

Internet Source

<1%

8

David Ansong, Gina A. Chowa, Michael Sherraden. "Household assets, academic expectations, and academic performance among Ghanaian junior high school students: Investigating mediation", Children and Youth Services Review, 2015

Publication

<1 %

9

www.tandfonline.com

Internet Source

<1 %

10

Submitted to University of Hyderabad, Hyderabad

Student Paper

<1 %

11

www.eel.my100megs.com

Internet Source

<1 %

12

Anupam Joya Sharma, Malavika Ambale Subramanyam. "The intersectional role of paternal gender-equitable attitudes and maternal empowerment on child undernutrition in India", Cold Spring Harbor Laboratory, 2021

Publication

<1 %

13

egyankosh.ac.in

Internet Source

<1 %

14

www.tarj.in

Internet Source

<1 %

15 Singh, Abhijeet. "Private school effects in urban and rural India: Panel estimates at primary and secondary school ages", Journal of Development Economics, 2015.

Publication

<1 %

16 www.mdpi.com

Internet Source

<1 %

17 ebooks.ien.bg.ac.rs

Internet Source

<1 %

18 safesupportivelearning.ed.gov

Internet Source

<1 %

19 digitalcommons.lsu.edu

Internet Source

<1 %

20 Adekemi OBISESAN. "CROP DIVERSIFICATION, PRODUCTIVITY AND DIETARY DIVERSITY: A GENDER PERSPECTIVE", Review of Agricultural and Applied Economics, 2021

Publication

<1 %

21 www.researchgate.net

Internet Source

<1 %

22 shodhganga.inflibnet.ac.in

Internet Source

<1 %

23 repository.upenn.edu

Internet Source

<1 %

24 Submitted to HELP UNIVERSITY

Student Paper

<1 %

25 docplayer.net
Internet Source

<1 %

26 wrap.warwick.ac.uk
Internet Source

<1 %

27 Charu Jain, Narayan Prasad. "Quality of
Secondary Education in India", Springer
Science and Business Media LLC, 2018
Publication

<1 %

28 Submitted to Texas A&M University, College
Station
Student Paper

<1 %

29 Submitted to Ambedkar University Delhi
Student Paper

<1 %

30 article.aascit.org
Internet Source

<1 %

31 papers.ssrn.com
Internet Source

<1 %

32 www.cenbank.gov.ng
Internet Source

<1 %

33 Submitted to Lal Bahadur Shastri National
Academy of Administration of Management
Student Paper

<1 %

34 isiarticles.com

<1 %

35

repositorio.grade.org.pe

Internet Source

<1 %

36

publikationen.bibliothek.kit.edu

Internet Source

<1 %

37

pearl.plymouth.ac.uk

Internet Source

<1 %

38

www.stat.wisc.edu

Internet Source

<1 %

39

Kevin K.H. Chung. "Socioeconomic Status and Academic Achievement", Elsevier BV, 2015

Publication

<1 %

40

Muhammad Shahadat Hossain Siddiquee, Md Amzad Hossain. "Exploring Gender Wage Gap in Urban Labor Market of Bangladesh", Research in Applied Economics, 2018

Publication

<1 %

41

Saswati Das, Diganta Mukherjee. "Measuring Deprivation Due to Child Work and Child Labour: A Study for Indian Children", Child Indicators Research, 2010

Publication

<1 %

42

Zhan, M.. "Assets, parental expectations and involvement, and children's educational

<1 %

performance", Children and Youth Services Review, 200608

Publication

43

en.unionpedia.org

Internet Source

<1 %

44

"Universal Secondary Education in India",
Springer Science and Business Media LLC,
2020

Publication

<1 %

45

Sangeeta Goyal. "Inside the house of learning:
the relative performance of public and private
schools in Orissa", Education Economics, 2009

Publication

<1 %

46

repec.ethz.ch

Internet Source

<1 %

47

www.iza.org

Internet Source

<1 %

48

Submitted to Westminster International
University in Tashkent

Student Paper

<1 %

49

pure.uva.nl

Internet Source

<1 %

50

touro scholar.touro.edu

Internet Source

<1 %

51

www.nzherald.co.nz

Internet Source

<1 %

52

Submitted to CSU, Hayward

Student Paper

<1 %

53

scholarworks.moreheadstate.edu

Internet Source

<1 %

54

www.nlsinfo.org

Internet Source

<1 %

55

God'stime Osekhebhen Eigbiremolen.
"Determinants of Learning among Primary
School Children in Ethiopia: Analysis of Round
2 and 3 of Young Lives Data", African
Development Review, 2017

Publication

<1 %

56

Renu Singh, Protap Mukherjee. "Effect of
preschool education on cognitive
achievement and subjective wellbeing at age
12: evidence from India", Compare: A Journal
of Comparative and International Education,
2018

Publication

<1 %

57

Taekwon Kim. "The Technology Licensing
Market in the Asia-Pacific Region: An Empirical
Examination of Technology Licensing
Contracts of American and Japanese Firms
with Korean Firms", Pacific Focus, 2008

Publication

<1 %

58

etd.aau.edu.et

Internet Source

<1 %

59

krex.k-state.edu

Internet Source

<1 %

60

Submitted to Higher Education Commission
Pakistan

Student Paper

<1 %

61

Irma Arteaga, Paul Glewwe. "Do community
factors matter? An analysis of the
achievement gap between indigenous and
non-indigenous children in Peru",
International Journal of Educational
Development, 2017

Publication

<1 %

62

Kumar, Abhishek, and Aditya Singh.
"Decomposing the Gap in Childhood
Undernutrition between Poor and Non-Poor
in Urban India, 2005–06", PLoS ONE, 2013.

Publication

<1 %

63

Submitted to Rutgers University, New
Brunswick

Student Paper

<1 %

64

www.aarhat.com

Internet Source

<1 %

65

Artur Pokropek, Francesca Borgonovi, Maciej
Jakubowski. "Socio-economic disparities in
academic achievement: A comparative
analysis of mechanisms and pathways",
Learning and Individual Differences, 2015

<1 %

66	Mudit Kumar Verma, Shyam Sundar Kushwaha. "Awareness towards cybercrime among secondary school students: the role of gender and school management", Safer Communities, 2021	<1 %
----	---	------

Publication

67	recoup.educ.cam.ac.uk	<1 %
----	-----------------------	------

Internet Source

68	academic.oup.com	<1 %
----	------------------	------

Internet Source

69	Submitted to Pondicherry University	<1 %
----	-------------------------------------	------

Student Paper

70	researcherslinks.com	<1 %
----	----------------------	------

Internet Source

71	Janet Shibley Hyde. "GENDER COMPARISONS OF MATHEMATICS ATTITUDES AND AFFECT.", Psychology of Women Quarterly, 9/1990	<1 %
----	--	------

Publication

72	Submitted to Queensland University of Technology	<1 %
----	--	------

Student Paper

73	Submitted to University of Durham	<1 %
----	-----------------------------------	------

Student Paper

74	Yang Baoyan, Wan Minggang. "How Father's Education and Economic Capital Impact	<1 %
----	--	------

Academic Performance—An Analysis Based on the Mediating Effect and Moderating Effect", Chinese Education & Society, 2016

Publication

75	nvshq.org Internet Source	<1 %
76	repository.up.ac.za Internet Source	<1 %
77	Submitted to Coventry University Student Paper	<1 %
78	ijrcm.org.in Internet Source	<1 %
79	www.allentownpa.gov Internet Source	<1 %
80	www.newindianexpress.com Internet Source	<1 %
81	Submitted to University of Southampton Student Paper	<1 %
82	www.india.gov.in Internet Source	<1 %
83	Abhishek Kumar, Divya Kumari. "Decomposing the Rural-Urban Differentials in Childhood Malnutrition in India, 1992–2006", Asian Population Studies, 2014 Publication	<1 %

84	Deepak Kumar, Pradeep Kumar Choudhury. "Determinants of Private School Choice in India: All about the Family Backgrounds?", Journal of School Choice, 2020 Publication	<1 %
85	Di Tommaso, M.L.. "Children capabilities: A structural equation model for India", Journal of Socio-Economics, 200706 Publication	<1 %
86	Michael J. Robinson, Thomas J. Cottrell. "Investment Patterns of Informal Investors in the Alberta Private Equity Market*", Journal of Small Business Management, 2020 Publication	<1 %
87	lectitopublishing.nl Internet Source	<1 %
88	www.akceducation.org Internet Source	<1 %
89	www.scribd.com Internet Source	<1 %
90	Tanima Banerjee. "Impacts of Vocational Education and Training on Employment and Wages in Indian Manufacturing Industries: Variation across Social Groups—Empirical Evidences from the 68th Round NSSO Data", The Indian Journal of Labour Economics, 2017 Publication	<1 %

91	Diane Dancer, Anu Rammohan. "Determinants of Schooling in Egypt: The Role of Gender and Rural/Urban Residence", Oxford Development Studies, 2007 Publication	<1 %
92	ujala.uk.gov.in Internet Source	<1 %
93	International Journal of Sociology and Social Policy, Volume 33, Issue 1-2 (2013-05-27) Publication	<1 %
94	Submitted to Northcentral Student Paper	<1 %
95	Submitted to Utah Education Network Student Paper	<1 %
96	doczz.net Internet Source	<1 %
97	"The State of China's State Capitalism", Springer Science and Business Media LLC, 2018 Publication	<1 %
98	Submitted to University of Cambridge Student Paper	<1 %
99	ccsniam.gov.in Internet Source	<1 %
100	unesdoc.unesco.org Internet Source	<1 %

101	China Agricultural Economic Review, Volume 6, Issue 2 (2014-09-16) Publication	<1 %
102	C. M. Yamamura. "Risk Factors for Vitamin A Deficiency among Preschool Aged Children in Pohnpei, Federated States of Micronesia", Journal of Tropical Pediatrics, 02/01/2004 Publication	<1 %
103	G. Gandhi Kingdon. "The Gender Gap in Educational Attainment in India: How Much Can Be Explained?", Journal of Development Studies, 2002 Publication	<1 %
104	digitalcommons.pepperdine.edu Internet Source	<1 %
105	nlsinfo.org Internet Source	<1 %
106	www.insightsonindia.com Internet Source	<1 %
107	www.meducationalliance.org Internet Source	<1 %
108	www.science.gov Internet Source	<1 %
109	www.scinapse.io Internet Source	<1 %

110

www.termpaperwarehouse.com

Internet Source

<1 %

111

Glewwe, Paul, Qihui Chen, and Bhagyashree Kataré. "What Determines Learning among Kinh and Ethnic Minority Students in Vietnam? An Analysis of the Round 2 Young Lives Data : Young Lives Data Analysis", Asia & the Pacific Policy Studies, 2015.

Publication

<1 %

112

Harris, Peter. "EBOOK: Designing and Reporting Experiments in Psychology", EBOOK: Designing and Reporting Experiments in Psychology, 2008

Publication

<1 %

113

[Submitted to IIT Delhi](#)

Student Paper

<1 %

114

[Submitted to Jamia Milia Islamia University](#)

Student Paper

<1 %

115

Wun-Ji Jiang, Yir-Hueih Luh. "Gender digital divide in a patriarchal society: what can we learn from Blinder–Oaxaca decomposition?", Quality & Quantity, 2016

Publication

<1 %

116

anubooks.com

Internet Source

<1 %

117

download.ei-ie.org

Internet Source

<1 %

118 samagra.mhrd.gov.in
Internet Source

<1 %

119 www.businesssteacher.org.uk
Internet Source

<1 %

120 www.legalserviceindia.com
Internet Source

<1 %

121 www.ukessays.com
Internet Source

<1 %

122 Chang, Hung-Hao. "Consumption inequality between farm and nonfarm households in Taiwan: a decomposition analysis of differences in distribution", *Agricultural Economics*, 2012.
Publication

<1 %

123 Kaspar Burger, Marlene Walk. "Can children break the cycle of disadvantage? Structure and agency in the transmission of education across generations", *Social Psychology of Education*, 2016
Publication

<1 %

124 Laura Helena Kivi, Janno Järve, Sten Anspal, Marko Sõmer, Indrek Seppo. "Are we there yet? Intergenerational mobility and economic

<1 %

assimilation of second-generation immigrants in Estonia", Baltic Journal of Economics, 2021

Publication

-
- | | | |
|-----------------|---|------|
| 125 | Myron Weiner. "Sons of the Soil: Migration and Ethnic Conflict in India", Walter de Gruyter GmbH, 2015 | <1 % |
| Publication | | |
| 126 | Neha Seth, Sanjay K. Mohanty. "Poor and non-poor differentials in household health spending in India", Journal of Public Health, 2016 | <1 % |
| Publication | | |
| 127 | T.K. Oommen. "Education in Independent India", Contemporary Education Dialogue, 2017 | <1 % |
| Publication | | |
| 128 | Submitted to University of Queensland | <1 % |
| Student Paper | | |
| 129 | mde.edu.vn | <1 % |
| Internet Source | | |
| 130 | www.diva-portal.org | <1 % |
| Internet Source | | |
| 131 | www.econstor.eu | <1 % |
| Internet Source | | |
| 132 | www.educationforallinindia.com | <1 % |
| Internet Source | | |
-

133	"Reading Achievement and Motivation in Boys and Girls", Springer Science and Business Media LLC, 2018 Publication	<1 %
134	Arpita Ghose. "Efficiency of Elementary Education in India", Springer Science and Business Media LLC, 2017 Publication	<1 %
135	Rangachar Govinda, Madhumita Bandyopadhyay. "Social exclusion and school participation in India: Expanding access with equity", PROSPECTS, 2010 Publication	<1 %
136	doi.org Internet Source	<1 %
137	idoc.pub Internet Source	<1 %
138	scholars.unh.edu Internet Source	<1 %
139	socialworkers.org Internet Source	<1 %
140	Submitted to Amity University Student Paper	<1 %
141	Ching-Yi Lee, Hsin-Yi Kung. "Math Self-Concept and Mathematics Achievement: Examining Gender Variation and Reciprocal	<1 %

Relations among Junior High School Students
in Taiwan", Eurasia Journal of Mathematics,
Science and Technology Education, 2018

Publication

- 142 Nozomi Nakajima, Haeil Jung, Menno Pradhan, Amer Hasan, Angela Kinnell, Sally Brinkman. "Gender gaps in cognitive and social - emotional skills in early primary grades: Evidence from rural Indonesia", Developmental Science, 2020

Publication

- 143 Shrabanti Maity. "An Inquiry into the Literacy Status of Women in West Bengal and India", Women's Studies, 2016

Publication

- 144 en.wikipedia.org

Internet Source

- 145 nuepa.org

Internet Source

- 146 prism.ucalgary.ca

Internet Source

- 147 sro.sussex.ac.uk

Internet Source

Exclude bibliography ☒ On