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THE IMPACT OF DECENTRALIZED DECISION-MAKING ON PARENTAL DISSATISFACTION IN PRIMARY TO SECONDARY SCHOOLS

By
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A Thesis

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Abstract -

This research explores how the structure of a school impacts parental dissatisfaction with their child's received education. The structure of the school, based on its level of decentralization, is empirically measured using an Index created from variables in the PISA 2015 datasets and captures who (at the school) holds the responsibilities for various job categories, such as making decisions about budget allocations, textbook choice, and disciplinary policies. The index ranges between 1 and 5, with lower scores earned when responsibilities are fulfilled with more centralized individuals (such as a national education authority) and higher scores earned if that same responsibility is fulfilled by a more decentralized individual (such as a teacher). Polity Scores, which are used to measure the degree of national decentralization, are used to control for national pressures on school behavior. Preliminary results suggest that parental dissatisfaction is greater when decision-making is decentralized at the school level but is lower if the parent is located in a more democratized country.

Through this research I hope to offer insight into the structural aspects of school decision-making behavior and how they impact parental attitudes about the school their child attends.

Table of Contents

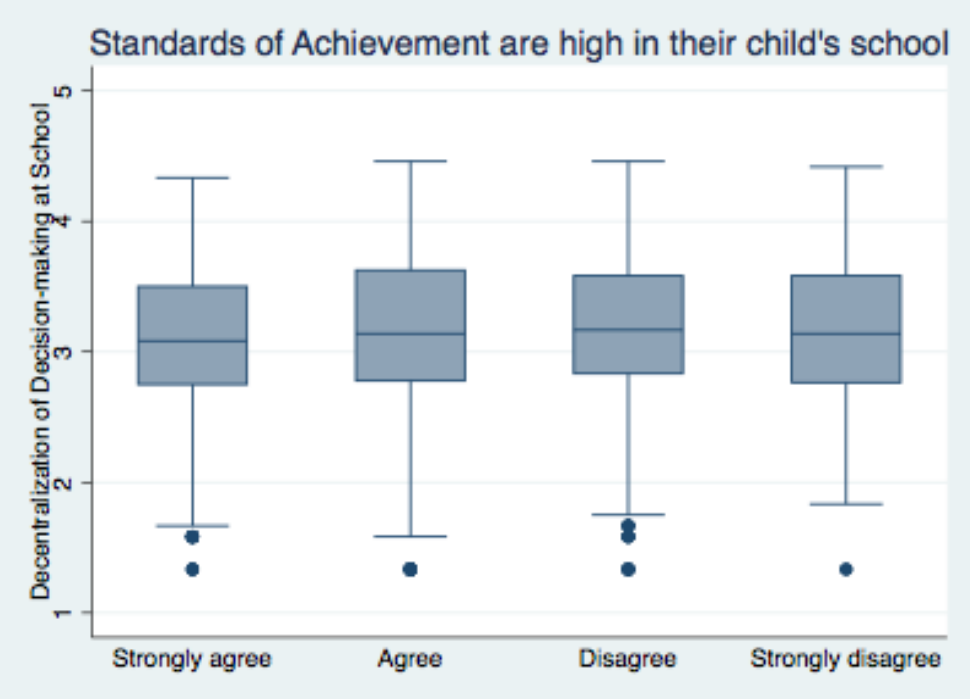
Title **Page**

Table of Figures

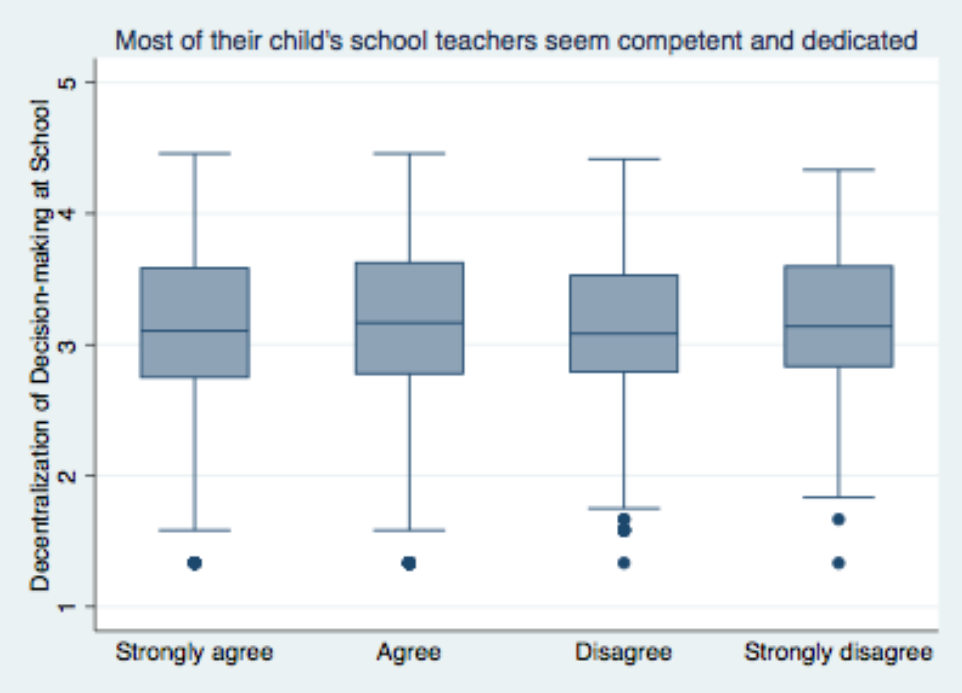
Graph **Page**

1. Graphs

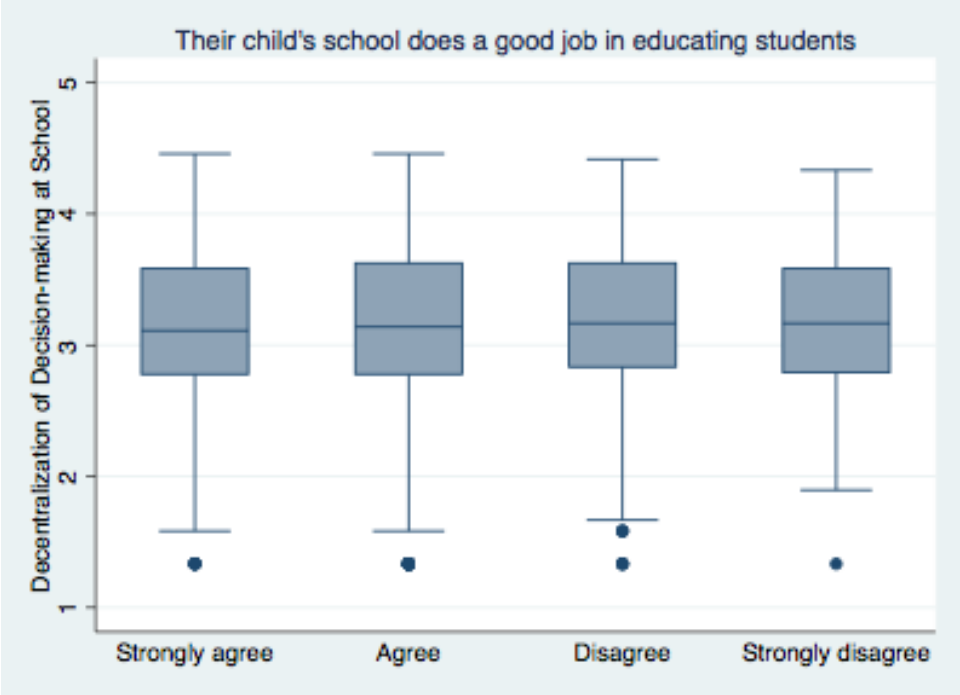
Graph 1 -



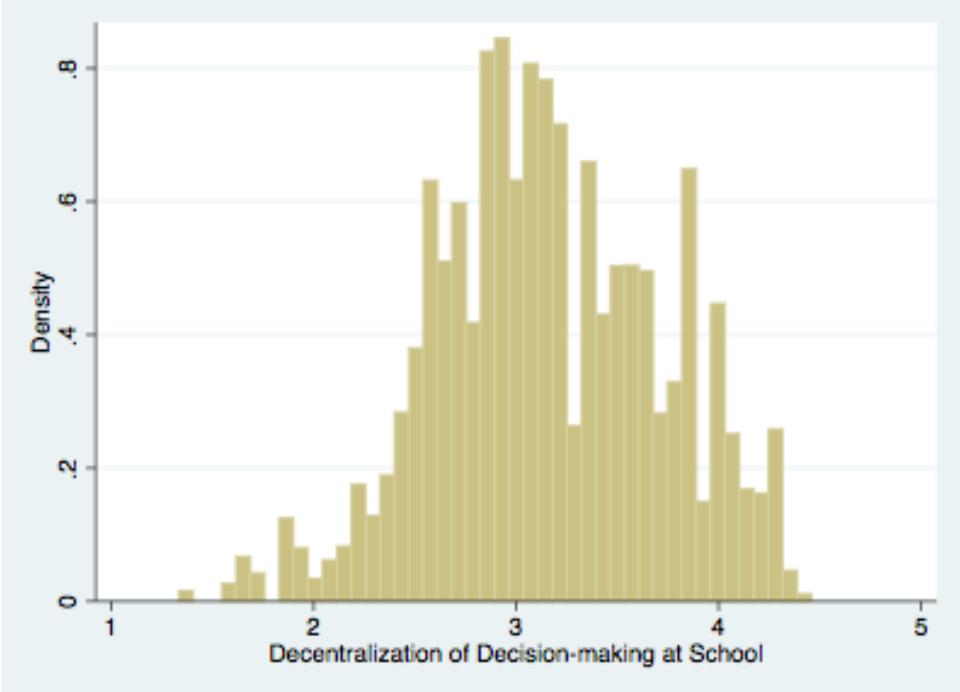
Graph 2 -



Graph 3 -



Graph 4 - Histogram of Decentralization of Decision-making at School variable



2. Tables

Table 1: Summary Statistics Table For Parent Level Variables Equation 1

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.19	0.58	23,826	1	4
Polity	6.60	6.38	23,826	-7	10
Private School	1.43	0.50	23,826	1	2
Teacher Professional Development	1.40	0.22	23,826	1	2
Teacher Certification	75.21	61.60	23,826	0	342
Mother's Education	3.72	1.73	23,826	0	6
Teacher's Education Levels	3.24	0.60	23,826	1	5
Standards of Achievement Are high in their child's School	2.03	0.67	23,826	1	4

Table 2: Summary Statistics Table For Parent Level Variables Equation 2

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.19	0.58	23,896	1.33	4.46
Polity	6.60	6.38	23,896	-7	10
Private School	1.43	0.50	23,896	1	2
Teacher Professional Development	1.40	0.22	23,896	1	2
Teacher Certification	75.18	61.54	23,896	0	342
Mother's Education	3.72	1.73	23,896	0	6
Teacher's Education Levels	3.24	0.60	23,896	1	5
Most of their child's school Teachers seem competent and Dedicated	1.82	0.61	23,896	1	4

Table 3: Summary Statistics Table For Parent Level Variables Equation 3

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.19	0.58	23,851	1.33	4.46
Polity	6.60	6.38	23,851	-7	10
Private School	1.43	0.50	23,851	1	2
Teacher Professional Development	1.40	0.22	23,851	1	2
Teacher Certification	75.20	61.61	23,851	0	342
Mother's Education	3.72	1.73	23,851	0	6
Teacher's Education Levels	3.24	0.60	23,851	1	5
Their Child's School Does a good job in educating students	1.85	0.59	23,851	1	4

Table 4: Ordered Probit for Equation 1 - Standards of Achievement are high in their child's school

	1	2	3	4
Decentralization of Decision-making at school	0.12*** (0.02)	0.14*** (0.03)	0.20*** (0.02)	
Polity	-0.02*** (0.00)	-0.02 (0.01)		-0.02*** (0.00)
Private School	-0.31*** (0.02)	-0.31*** (0.02)	-0.26*** (0.02)	-0.24*** (0.02)
Teacher Certification	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Teacher Education level 2	-0.07 (0.09)	-0.07 (0.09)	-0.05 (0.09)	-0.09 (0.09)
Teacher Education level 3	-0.08 (0.07)	-0.08 (0.07)	-0.05 (0.07)	-0.09 (0.07)
Teacher Education level 4	-0.00 (0.07)	-0.00 (0.08)	0.04 (0.07)	-0.01 (0.07)
Teacher Education level 5	-0.08 (0.08)	-0.08 (0.08)	-0.09 (0.08)	-0.10 (0.08)
Teachers years of Professional development	0.11** (0.04)	0.11** (0.04)	-0.01 (0.04)	0.11** (0.04)
Mother's education level 1	-0.13** (0.05)	-0.13** (0.05)	-0.10* (0.05)	-0.13** (0.05)
Mother's education level 2	-0.12** (0.04)	-0.12** (0.04)	-0.12** (0.04)	-0.11* (0.04)
Mother's education level 3	-0.07 (0.05)	-0.07 (0.05)	-0.10* (0.05)	-0.06 (0.05)
Mother's education level 4	-0.12** (0.04)	-0.12** (0.04)	-0.15*** (0.04)	-0.11* (0.04)
Mother's education level 5	-0.10* (0.05)	-0.10* (0.05)	-0.14** (0.05)	-0.08 (0.05)
Mother's education level 6	-0.23*** (0.04)	-0.23*** (0.04)	-0.29*** (0.04)	-0.21*** (0.04)

Interaction between Decentralization and polity		-0.00 (0.00)		
cut1				
Constant	-1.23*** (0.12)	-1.18*** (0.15)	-0.87*** (0.11)	-1.57*** (0.10)
cut2				
Constant	0.52*** (0.12)	0.57*** (0.15)	0.87*** (0.11)	0.18 (0.10)
cut3				
Constant	1.77*** (0.12)	1.82*** (0.15)	2.12*** (0.11)	1.42*** (0.10)
Observations	23826	23826	23826	23826

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 5: Ordered Probit for Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated

	1	2	3	4
Decentralization of Decision-making at school	0.10*** (0.02)	0.11*** (0.03)	0.18*** (0.02)	
Polity	-0.02*** (0.00)	-0.01 (0.01)		-0.02*** (0.00)
Private School	-0.32*** (0.02)	-0.32*** (0.02)	-0.26*** (0.02)	-0.27*** (0.02)
Teacher Certification	-0.00 (0.00)	-0.00 (0.00)	0.00*** (0.00)	-0.00 (0.00)
Teacher Education level 2	0.01 (0.10)	0.01 (0.10)	0.04 (0.10)	0.00 (0.10)
Teacher Education level 3	0.07 (0.08)	0.07 (0.08)	0.09 (0.08)	0.05 (0.08)
Teacher Education level 4	0.14 (0.08)	0.14 (0.08)	0.18* (0.08)	0.13 (0.08)
Teacher Education level 5	0.01 (0.09)	0.01 (0.09)	-0.00 (0.08)	-0.01 (0.08)
Teachers years of Professional development	0.10* (0.04)	0.10* (0.04)	-0.03 (0.04)	0.10* (0.04)
Mother's education level 1	-0.02 (0.05)	-0.02 (0.05)	0.01 (0.05)	-0.02 (0.05)
Mother's education level 2	0.00 (0.05)	0.00 (0.05)	-0.00 (0.05)	0.01 (0.05)
Mother's education level 3	0.10 (0.05)	0.10 (0.05)	0.06 (0.05)	0.10 (0.05)
Mother's education level 4	0.11* (0.05)	0.11* (0.05)	0.08 (0.05)	0.12** (0.05)
Mother's education level 5	0.11* (0.05)	0.11* (0.05)	0.07 (0.05)	0.12* (0.05)
Mother's education level 6	0.03 (0.05)	0.03 (0.05)	-0.03 (0.05)	0.04 (0.05)

Interaction between Decentralization and polity		-0.00 (0.00)		
cut1				
Constant	-0.66*** (0.12)	-0.58*** (0.16)	-0.28* (0.12)	-0.92*** (0.11)
cut2				
Constant	1.34*** (0.12)	1.43*** (0.16)	1.72*** (0.12)	1.09*** (0.11)
cut3				
Constant	2.16*** (0.12)	2.25*** (0.16)	2.54*** (0.12)	1.91*** (0.11)
Observations	23896	23896	23896	23896

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 6: Ordered Probit for Equation 3 - Their Child's School does a good job in educating students

	1	2	3	4
Decentralization of Decision-making at school	0.06** (0.02)	0.11*** (0.03)	0.18*** (0.02)	
Polity	-0.03*** (0.00)	-0.01 (0.01)		-0.03*** (0.00)
Private School	-0.28*** (0.02)	-0.28*** (0.02)	-0.19*** (0.02)	-0.24*** (0.02)
Teacher Certification	0.00 (0.00)	0.00 (0.00)	0.00*** (0.00)	-0.00 (0.00)
Teacher Education level 2	-0.11 (0.10)	-0.11 (0.10)	-0.07 (0.10)	-0.12 (0.10)
Teacher Education level 3	0.01 (0.08)	0.01 (0.08)	0.03 (0.08)	-0.00 (0.08)
Teacher Education level 4	0.11 (0.08)	0.12 (0.08)	0.17* (0.08)	0.11 (0.08)
Teacher Education level 5	0.01 (0.08)	0.01 (0.08)	-0.01 (0.08)	-0.00 (0.08)
Teachers years of Professional development	0.30*** (0.04)	0.30*** (0.04)	0.13*** (0.04)	0.30*** (0.04)
Mother's education level 1	-0.06 (0.05)	-0.06 (0.05)	-0.02 (0.05)	-0.06 (0.05)
Mother's education level 2	-0.01 (0.05)	-0.01 (0.05)	-0.02 (0.05)	-0.01 (0.05)
Mother's education level 3	0.05 (0.05)	0.05 (0.05)	0.00 (0.05)	0.06 (0.05)
Mother's education level 4	0.07 (0.05)	0.08 (0.05)	0.03 (0.05)	0.08 (0.05)
Mother's education level 5	0.12* (0.05)	0.12** (0.05)	0.06 (0.05)	0.13** (0.05)
Mother's education	0.04	0.04	-0.05	0.04

level 6	(0.05)	(0.05)	(0.05)	(0.05)
Interaction between Decentralization and polity		-0.01* (0.00)		
cut1				
Constant	-0.58*** (0.12)	-0.39* (0.16)	-0.06 (0.12)	-0.75*** (0.11)
cut2				
Constant	1.47*** (0.12)	1.66*** (0.16)	1.97*** (0.12)	1.30*** (0.11)
cut3				
Constant	2.37*** (0.12)	2.57*** (0.16)	2.88*** (0.12)	2.21*** (0.11)
Observations	23851	23851	23851	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 7: Marginal Effects of Ordered Probits

	1=Strongly Agree	2=Agree	3=Disagree	4=Strongly Disagree
Equation 1 - Standards of Achievement are high in their child's school				
Observations	23826	23826	23826	23826
Decentralization of Decision-making at school	-0.03*** (0.01)	-0.00*** (0.00)	0.03*** (0.00)	0.01*** (0.00)
Polity	0.01*** (0.00)	0.00*** (0.00)	-0.01*** (0.00)	-0.00*** (0.00)
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated				
Observations	23896	23896	23896	23896
Decentralization of Decision-making at school	-0.03*** (0.01)	0.02*** (0.00)	0.01*** (0.00)	0.00*** (0.00)
Polity	0.01*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Equation 3 - Their Child's School does a good job in educating students				
Observations	23851	23851	23851	23851
Decentralization of Decision-making at school	-0.02** (0.01)	0.01** (0.00)	0.01** (0.00)	0.00** (0.00)
Polity	0.01*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 8: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction interacting polity and decentralization of decision-making at school

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.25* (0.11)	0.17* (0.07)	0.17 (0.09)
Polity	0.06 (0.04)	0.04 (0.03)	0.04 (0.04)
Decentralization of Decision-making at School Interacted with Polity	-0.02* (0.01)	-0.02* (0.01)	-0.02* (0.01)
Private	-0.34*** (0.05)	-0.30*** (0.04)	-0.33*** (0.05)
Teacher Certification	-0.00** (0.00)	0.00* (0.00)	0.00 (0.00)
Teacher Education Level 2	0.03 (0.10)	0.06 (0.10)	-0.15 (0.10)
Teacher Education Level 3	-0.03 (0.08)	0.07 (0.08)	-0.10 (0.08)
Teacher Education Level 4	-0.04 (0.08)	0.10 (0.08)	-0.07 (0.09)
Teacher Education Level 5	0.05 (0.09)	0.07 (0.09)	-0.05 (0.09)
Teachers years of Professional development	0.015 (0.08)	0.07 (0.06)	0.17* (0.07)
Mother's Education Level 1	-0.14** (0.05)	-0.03 (0.05)	-0.04 (0.05)
Mother's Education Level 2	-0.16*** (0.05)	-0.05 (0.05)	-0.03 (0.05)
Mother's Education Level 3	-0.09 (0.05)	0.01 (0.05)	0.01 (0.05)
Mother's Education Level 4	-0.14** (0.05)	0.01 (0.05)	0.03 (0.05)

Mother's Education Level 5	-0.14**	-0.03	0.02
	(0.05)	(0.05)	(0.05)
Mother's Education Level 6	-0.13**	-0.01	0.07
	(0.05)	(0.05)	(0.05)
cut1			
Constant	-0.93*	-0.35	-0.54
	(0.42)	(0.31)	(0.37)
cut2			
Constant	0.97*	1.73***	1.62***
	(0.42)	(0.31)	(0.37)
cut3			
Constant	2.31***	2.56***	2.56***
	(0.42)	(0.31)	(0.37)
Observations	23826	23896	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 9: Summary Statistics Table For School Level Variables

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.07	0.53	886	1.33	4.46
Polity	8.83	3.73	886	-7	10
Private School	1.31	0.46	886	1	2
Teacher Professional Development	1.44	0.23	886	1	2
Teacher Certification	64.21	57.58	886	0	342
Average Mother's Education	3.81	0.93	886	0.67	5.93
Average Teacher's Education Levels	3.20	0.26	886	2	4.07
Average Standards of Achievement Are high in their child's School	2.04	0.27	886	1.13	3.13
Average Most of their child's school Teachers seem competent and Dedicated	1.82	0.20	886	1	2.75
Average Their Child's School Does a good job in educating students	1.83	0.22	886	1	2.63

Table 10: OLS estimation of Parental Dissatisfaction-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.10*** (0.02)	0.05** (0.02)	0.04* (0.02)
polity	-0.01*** (0.00)	-0.01*** (0.00)	-0.02*** (0.00)
Private	-0.17*** (0.03)	-0.20*** (0.02)	-0.16*** (0.02)
Teacher Professional Development	0.07 (0.04)	0.05 (0.03)	0.11*** (0.03)
Teacher Certification	-0.00*** (0.00)	-0.00 (0.00)	-0.00 (0.00)
Average Mother's Education	-0.06*** (0.01)	0.02* (0.01)	-0.01 (0.01)
Average Teacher's Education Levels	0.02 (0.04)	0.03 (0.03)	0.11*** (0.03)
Constant	2.17*** (0.14)	1.84*** (0.10)	1.57*** (0.11)
Observations	886	886	886

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 11: OLS estimation of Parental Dissatisfaction Using a Binary Version Of the Polity Variable where if polity is positive the Value is 1 and if the value is negative then the value is 0- School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.12*** (0.02)	0.05** (0.02)	0.05** (0.02)
Dummy polity variable	-0.12*** (0.03)	-0.19*** (0.03)	-0.21*** (0.03)
Private	-0.17*** (0.03)	-0.20*** (0.02)	-0.16*** (0.02)
Teacher Professional Development	0.06 (0.04)	0.04 (0.03)	0.11** (0.03)
Teacher Certification	-0.00*** (0.00)	-0.00 (0.00)	-0.00 (0.00)
Average Mother's Education	-0.06*** (0.01)	0.02* (0.01)	-0.01 (0.01)
Average Teacher's Education Levels	0.03 (0.04)	0.04 (0.03)	0.12*** (0.03)
Constant	2.12*** (0.14)	1.83*** (0.10)	1.56*** (0.11)
Observations	886	886	886

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 12: OLS estimation of Parental Dissatisfaction in Italy-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.12**	0.04	0.06
	(0.04)	(0.04)	(0.04)
Private	-0.07	-0.24***	-0.20**
	(0.07)	(0.06)	(0.07)
Teacher Professional Development	-0.12	-0.07	-0.06
	(0.06)	(0.05)	(0.05)
Teacher Certification	0.00	0.00	0.00*
	(0.00)	(0.00)	(0.00)
Average Mother's Education	-0.11***	-0.00	-0.05*
	(0.03)	(0.02)	(0.02)
Average Teacher's Education Levels	-0.07	0.06	0.02
	(0.08)	(0.06)	(0.06)
Constant	2.51***	1.92***	2.00***
	(0.26)	(0.17)	(0.22)
Observations	258	258	258

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 13: OLS estimation of Parental Dissatisfaction in Korea-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.03 (0.06)	0.05 (0.03)	0.01 (0.04)
Private	-0.17*** (0.05)	-0.09** (0.03)	-0.09** (0.03)
Teacher Professional Development	-0.07 (0.14)	0.12 (0.08)	0.08 (0.08)
Teacher Certification	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Average Mother's Education	-0.34*** (0.05)	-0.10** (0.03)	-0.10** (0.04)
Average Teacher's Education Levels	0.00 (0.12)	-0.02 (0.07)	-0.02 (0.08)
Constant	3.89*** (0.47)	2.16*** (0.29)	2.43*** (0.31)
Observations	136	136	136

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 14: OLS estimation of Parental Dissatisfaction in Macao-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.14*	0.00	0.08
	(0.06)	(0.06)	(0.07)
Private	-0.15	-0.15	-0.16
	(0.08)	(0.08)	(0.11)
Teacher Professional Development	-0.20	0.01	0.17
	(0.23)	(0.16)	(0.26)
Teacher Certification	-0.00**	0.00	0.00
	(0.00)	(0.00)	(0.00)
Average Mother's Education	-0.09***	-0.03	-0.01
	(0.02)	(0.02)	(0.02)
Average Teacher's Education Levels	0.07	-0.09	0.01
	(0.15)	(0.11)	(0.17)
Constant	2.27***	2.51***	1.73*
	(0.62)	(0.49)	(0.67)
Observations	45	45	45

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 15: OLS estimation of Parental Dissatisfaction in Portugal-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.00 (0.04)	-0.01 (0.03)	-0.02 (0.03)
Private	-0.35*** (0.07)	-0.43*** (0.06)	-0.39*** (0.07)
Teacher Professional Development	0.17 (0.11)	0.16 (0.10)	0.14 (0.10)
Teacher Certification	-0.00* (0.00)	-0.00 (0.00)	0.00 (0.00)
Average Mother's Education	-0.10*** (0.02)	0.01 (0.02)	0.01 (0.01)
Average Teacher's Education Levels	-0.07 (0.07)	0.05 (0.07)	0.05 (0.06)
Constant	2.64*** (0.32)	1.80*** (0.30)	1.85*** (0.28)
Observations	142	142	142

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 16: OLS estimation of Parental Dissatisfaction in Spain-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	-0.04 (0.06)	0.04 (0.05)	0.01 (0.05)
Private	-0.13* (0.06)	-0.19*** (0.05)	-0.19*** (0.05)
Teacher Professional Development	0.05 (0.10)	0.08 (0.10)	0.12 (0.10)
Teacher Certification	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Average Mother's Education	-0.06* (0.02)	0.02 (0.02)	-0.01 (0.03)
Average Teacher's Education Levels	-0.09 (0.12)	-0.04 (0.11)	-0.03 (0.13)
Constant	2.77*** (0.47)	1.86*** (0.49)	2.01*** (0.56)
Observations	159	159	159

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 17: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction for Equation 1 - Standards of Achievement are high in their child's school

	1	2	3	4
Decentralization of Decision-making at school	0.25* (0.11)	0.07 (0.05)	0.07 (0.05)	
Polity	0.06 (0.04)	-0.02* (0.01)		-0.03* (0.01)
Interaction between Decentralization and polity		-0.02* (0.01)		
Private	-0.34*** (0.05)	-0.34*** (0.05)	-0.33*** (0.05)	-0.30*** (0.05)
Teacher Certification	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)
Teacher Education level 2	0.03 (0.10)	0.03 (0.10)	0.03 (0.10)	0.03 (0.10)
Teacher Education level 3	-0.03 (0.08)	-0.03 (0.08)	-0.03 (0.08)	-0.03 (0.08)
Teacher Education level 4	-0.04 (0.08)	-0.04 (0.08)	-0.05 (0.08)	-0.05 (0.08)
Teacher Education level 5	0.05 (0.09)	0.05 (0.09)	0.05 (0.09)	0.05 (0.09)
Teachers years of Professional development	0.01 (0.08)	0.02 (0.08)	0.01 (0.08)	0.02 (0.08)
Mother's education level 1	-0.14** (0.05)	-0.14** (0.05)	-0.14** (0.05)	-0.14** (0.05)
Mother's education level 2	-0.16*** (0.05)	-0.16*** (0.05)	-0.16*** (0.05)	-0.16*** (0.05)
Mother's education level 3	-0.09 (0.05)	-0.09 (0.05)	-0.09 (0.05)	-0.09 (0.05)
Mother's education level 4	-0.14** (0.05)	-0.14** (0.05)	-0.14** (0.05)	-0.14** (0.05)
Mother's education	-0.14**	-0.14**	-0.14**	-0.14**

level 5	(0.05)	(0.05)	(0.05)	(0.05)
Mother's education level 6	-0.13** (0.05)	-0.13** (0.05)	-0.13** (0.05)	-0.13** (0.05)
cut1				
Constant	-0.93* (0.42)	-1.63*** (0.23)	-1.47*** (0.22)	-1.81*** (0.20)
cut2				
Constant	0.97* (0.42)	0.27 (0.23)	0.43 (0.22)	0.08 (0.20)
cut3				
Constant	2.31*** (0.42)	1.61*** (0.23)	1.77*** (0.22)	1.42*** (0.20)
Observations	23826	23826	23826	23826

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 18: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction for Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated

	1	2	3	4
Decentralization of Decision-making at school	0.17* (0.07)	0.03 (0.03)	0.03 (0.03)	
Polity	0.04 (0.03)	-0.02* (0.01)		-0.02* (0.01)
Interaction between Decentralization and polity		-0.02* (0.01)		
Private	-0.30*** (0.04)	-0.30*** (0.04)	-0.30*** (0.04)	-0.29*** (0.03)
Teacher Certification	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)	0.00* (0.00)
Teacher Education level 2	0.06 (0.10)	0.06 (0.10)	0.06 (0.10)	0.06 (0.10)
Teacher Education level 3	0.07 (0.08)	0.07 (0.08)	0.07 (0.08)	0.07 (0.08)
Teacher Education level 4	0.10 (0.08)	0.10 (0.08)	0.10 (0.08)	0.10 (0.08)
Teacher Education level 5	0.07 (0.09)	0.07 (0.09)	0.07 (0.09)	0.06 (0.09)
Teachers years of Professional development	0.07 (0.06)	0.08 (0.06)	0.07 (0.06)	0.08 (0.06)
Mother's education level 1	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)
Mother's education level 2	-0.05 (0.05)	-0.05 (0.05)	-0.05 (0.05)	-0.05 (0.05)
Mother's education level 3	0.01 (0.05)	0.01 (0.05)	0.00 (0.05)	0.01 (0.05)
Mother's education level 4	0.01 (0.05)	0.01 (0.05)	0.00 (0.05)	0.01 (0.05)
Mother's education	-0.03	-0.03	-0.03	-0.03

level 5	(0.05)	(0.05)	(0.05)	(0.05)
Mother's education level 6	-0.01 (0.05)	-0.01 (0.05)	-0.01 (0.05)	-0.01 (0.05)
cut1				
Constant	-0.35 (0.31)	-0.89*** (0.19)	-0.74*** (0.18)	-0.97*** (0.17)
cut2				
Constant	1.73*** (0.31)	1.18*** (0.19)	1.34*** (0.18)	1.11*** (0.17)
cut3				
Constant	2.56*** (0.31)	2.02*** (0.19)	2.18*** (0.19)	1.95*** (0.17)
Observations	23896	23896	23896	23896

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 19: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction for Equation 3 - Their Child's School does a good job in educating students

	1	2	3	4
Decentralization of Decision-making at school	0.171 (0.0890)	-0.0000288 (0.0399)	0.000878 (0.0400)	
Polity	0.0408 (0.0358)	-0.0323** (0.0107)		-0.0323** (0.0106)
Interaction between Decentralization and polity		-0.0195* (0.00907)		
Private	-0.334*** (0.0451)	-0.333*** (0.0453)	-0.330*** (0.0455)	-0.333*** (0.0396)
Teacher Certification	0.000620 (0.000338)	0.000660 (0.000339)	0.000740* (0.000339)	0.000660 (0.000339)
Teacher Education level 2	-0.153 (0.103)	-0.152 (0.103)	-0.153 (0.103)	-0.152 (0.103)
Teacher Education level 3	-0.0986 (0.0827)	-0.0983 (0.0827)	-0.0999 (0.0827)	-0.0983 (0.0827)
Teacher Education level 4	-0.0700 (0.0855)	-0.0705 (0.0856)	-0.0732 (0.0856)	-0.0705 (0.0855)
Teacher Education level 5	-0.0522 (0.0920)	-0.0521 (0.0920)	-0.0533 (0.0920)	-0.0521 (0.0920)
Teachers years of Professional development	0.172* (0.0713)	0.182* (0.0715)	0.170* (0.0713)	0.182* (0.0714)
Mother's education level 1	-0.0410 (0.0521)	-0.0412 (0.0521)	-0.0409 (0.0521)	-0.0412 (0.0521)
Mother's education level 2	-0.0297 (0.0479)	-0.0296 (0.0479)	-0.0302 (0.0480)	-0.0296 (0.0479)
Mother's education level 3	0.0132 (0.0542)	0.0124 (0.0542)	0.0105 (0.0542)	0.0124 (0.0542)
Mother's education level 4	0.0341 (0.0482)	0.0331 (0.0482)	0.0314 (0.0482)	0.0331 (0.0482)
Mother's education	0.0162	0.0152	0.0122	0.0152

level 5	(0.0510)	(0.0510)	(0.0510)	(0.0510)
Mother's education level 6	0.0697 (0.0495)	0.0669 (0.0495)	0.0650 (0.0495)	0.0669 (0.0495)
cut1				
Constant	-0.544 (0.369)	-1.182*** (0.217)	-0.967*** (0.215)	-1.182*** (0.186)
cut2				
Constant	1.621*** (0.369)	0.983*** (0.217)	1.198*** (0.215)	0.983*** (0.186)
cut3				
Constant	2.561*** (0.369)	1.923*** (0.218)	2.138*** (0.216)	1.923*** (0.187)
Observations	23851	23851	23851	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 20: Ordered Probit with a binary OECD variable instead of polity

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at school	0.143***	0.110***	0.0832***
	(0.0188)	(0.0195)	(0.0195)
OECD	-0.280***	-0.314***	-0.436***
	(0.0281)	(0.0291)	(0.0292)
Private	-0.307***	-0.320***	-0.272***
	(0.0213)	(0.0222)	(0.0222)
Teacher Certification	-0.00120***	0.0000203	0.000188
	(0.000137)	(0.000142)	(0.000142)
Teacher Education level 2	-0.0670	0.0171	-0.103
	(0.0920)	(0.0958)	(0.0961)
Teacher Education level 3	-0.0665	0.0735	0.0175
	(0.0733)	(0.0765)	(0.0764)
Teacher Education level 4	0.0150	0.155*	0.141
	(0.0748)	(0.0781)	(0.0779)
Teacher Education level 5	-0.0758	0.0101	0.00922
	(0.0815)	(0.0850)	(0.0849)
Teachers years of Professional development	0.0972**	0.0869*	0.292***
	(0.0370)	(0.0383)	(0.0386)
Mother's education level 1	-0.122*	-0.0146	-0.0518
	(0.0482)	(0.0500)	(0.0502)
Mother's education level 2	-0.119**	0.00386	-0.0101
	(0.0439)	(0.0456)	(0.0458)
Mother's education level 3	-0.0668	0.0927	0.0523
	(0.0493)	(0.0513)	(0.0515)
Mother's education level 4	-0.120**	0.112*	0.0782
	(0.0434)	(0.0451)	(0.0453)
Mother's education level 5	-0.0916*	0.116*	0.130**
	(0.0456)	(0.0474)	(0.0475)
Mother's education level 6	-0.239***	0.0230	0.0270
	(0.0442)	(0.0460)	(0.0461)

cut1			
Constant	-1.251***	-0.708***	-0.653***
	(0.118)	(0.123)	(0.123)
cut2			
Constant	0.496***	1.295***	1.392***
	(0.118)	(0.123)	(0.123)
cut3			
Constant	1.740***	2.116***	2.298***
	(0.119)	(0.124)	(0.125)
Observations	23826	23896	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 21: Ordered Probit estimation of Parental Dissatisfaction with Fixed Effects

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making			
at school	0.05**	0.02	0.00
	(0.02)	(0.02)	(0.02)
Private	-0.29***	-0.27***	-0.29***
	(0.02)	(0.02)	(0.02)
Teacher Certification	-0.00***	0.00**	0.00**
	(0.00)	(0.00)	(0.00)
Teacher Education	-0.09	0.04	-0.17
level 2	(0.09)	(0.10)	(0.10)
Teacher Education	-0.15*	0.06	-0.11
level 3	(0.07)	(0.08)	(0.08)
Teacher Education	-0.16*	0.08	-0.10
level 4	(0.08)	(0.08)	(0.08)
Teacher Education	-0.11	0.05	-0.08
level 5	(0.08)	(0.09)	(0.09)
Teachers years of	0.02	0.06	0.17***
Professional development	(0.04)	(0.04)	(0.04)
Mother's education	-0.15**	-0.04	-0.07
level 1	(0.05)	(0.05)	(0.05)
Mother's education	-0.16***	-0.05	-0.03
level 2	(0.04)	(0.05)	(0.05)
Mother's education	-0.15**	0.01	-0.01
level 3	(0.05)	(0.05)	(0.05)
Mother's education	-0.21***	0.01	0.02
level 4	(0.04)	(0.05)	(0.05)
Mother's education	-0.25***	-0.04	-0.01
level 5	(0.05)	(0.05)	(0.05)
Mother's education	-0.27***	-0.02	0.03
level 6	(0.04)	(0.05)	(0.05)
Chile	-0.09**	-0.03	-0.07*
	(0.03)	(0.03)	(0.03)

Italy	-0.16***	0.02	-0.26***
	(0.03)	(0.03)	(0.03)
Korea	0.23***	0.25***	0.23***
	(0.03)	(0.03)	(0.03)
Macao	0.24***	0.33***	0.41***
	(0.03)	(0.04)	(0.04)
Portugal	-0.26***	-0.19***	-0.23***
	(0.03)	(0.03)	(0.03)
cut1			
Constant	-1.53***	-0.68***	-0.91***
	(0.12)	(0.13)	(0.13)
cut2			
Constant	0.23	1.33***	1.15***
	(0.12)	(0.13)	(0.13)
cut3			
Constant	1.48***	2.15***	2.06***
	(0.12)	(0.13)	(0.13)
Observations	23826	23896	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

3. Introduction

This study investigates if the degree of decentralization in education-related decision-making plays a role in how satisfied parents are with the school their child attends. "Decentralization refers to the shifts in the location of those who govern, about transfers of authority from those in one location or level vis-à-vis education organizations, to those in another level." (Welsh and McGinn 1999, p.17). In simpler terms, decentralization is the delegation of decision-making to many lower level decision makers in the system in opposition to fewer higher-level decision makers. With this in mind, decentralization of decision-making in schools indicates, that more teachers and local administration are making decision about things such as teachers' salaries, textbooks used in classes, and hiring teachers as compared to centralized decisions on these items being made by local or national governments.

This study evaluates the impact of school-level decentralization of decision-making on parental satisfaction, on two different planes: one, on the degree of decentralization within the school system itself and two, at the structural impacts of the country as a whole. It is hypothesized that parents place their children in schools that strike a balance between accessibility and quality, and that the level of decentralization in decision-making behaviors at schools impacts parent perceptions about quality. While there is research pointing to decentralization as a possible good direction for many school systems, as evidenced by Ouchi (2006) or Galiani and Schargrodsky (2001), there is still much research to be done regarding this. I will test for whether the degree of

decentralization in education-related decision-making at schools has a statistically significant impact on parental satisfaction. I expect that if decentralization is the best direction for schools to take, as suggested by Noack (1971), then parents will signal a higher satisfaction score for schools that are more decentralized.

One issue that should be explicitly noted is that different parents with children attending the same school will have varied expectations and wishes for the school, some parents may be far harder to satisfy than others, while other parents may be hesitant to give an overly positive or negative rating of a school for one reason or another. I attempt to control for some of these unobserved differences in response with country-level government structure (measured by polity scores) to see if it gives any insight into parents reported perception of satisfaction with their child's school. Because there are these different factors that can come into play it will be interesting to consider parental happiness by school across a few countries and see if school decentralization or the country's governmental structure (measured by polity scores) could give any insight into what parents are looking for from their child's school. What I saw from the results were that parents trended towards being more dissatisfied with the education their child receives from more highly decentralized schools; even though parents in countries that were more highly democratized at the national level were more satisfied with the education their child receives.

4. Literature Review

Chapman (1973) brings to light some issues with how the concept of Centralization and Decentralization have been used. He draws inspiration spanning from politics to academia and appears to find the greatest issue with it being poorly defined, this leading to overly simplified answers that over generalize. Chapman discusses different types, Political and Administrative, of Centralization and Decentralization because, as he brings up, this is a multi-dimensional concept. Chapman does not claim to have the singular correct definition of the terms, but instead quotes from others before him, and encourages researchers to re-examine the language used and requests his peers to come to a unified definition.

Though Chapman (1973) does not look into differing perspectives by countries Vexliard (1970) does inspect the adaptation of decentralization by different countries. A point that he makes, that is not often brought up, is that countries that have a history of high levels of centralization experience inordinately high levels of issues when attempting to decentralize the schooling system. He also goes on to point out how countries more accustomed to a decentralized system often do route back to centralization, though they may decide against publicizing that information. Vexliard brings up several seemingly underrepresented points that can be synthesized as follows, a school of thought that works, in implementation for a certain subset of individuals will not work when implemented for another group, it could even be taken farther and say if it works for one group it will not work for another. While many might argue he goes too far in his points regarding human behavior it is good to recognize the possibility of the points.

Vexliard (1970) brings up the point that what helps one individual could hurt another. Galiani, Gertler and Schargrodsky (2008) look at decentralization by looking at its effect on inequality. To do this they set out to look at nation-wide school decentralization programs on the quality of education. They did this for Argentina specifically and in their findings described a general trend for the positive except for schools in poorer areas which had a low quality of administration creating higher education inequality.

The topic these authors have yet to discuss specifically is the effect on children. According to Diaz-Serrano and Meix-Llop (1970) fiscal decentralization extends to a positive outcome for student's test results in all areas encompassed in their study. In fact on page 21 they state "local governments are more efficient at allocating their expenditures"… "from the expenditure and revenue side, students perform better".

To look at it in a different light, is the quality of a school (determined by taking the average of test scores) and public-sector decentralization related? This is the argument proposed by Falcha and Fischer (1970). While they find the quality of schools goes up when government sponsored decentralization takes place. The authors' also state further research is necessary to determine more specifics on transmission and policy implementation.

If the above results can be replicated it could be assumed that parents would be more inclined to happiness with their child's school. This issue is explored by Noack (1971), who comes to the conclusion that more than the race or age of the respondent, the district of the school from which the education was being received was most relevant in determining their happiness. Further, the parents within the decentralized districts were happier than parents of a centralized district.

To look at the other side of the relationship in schools with the parents, we turn to the teachers. Addi-Raccah and Arviv-Elyashiv (2007) delve into school decentralization by reviewing the teachers' perceptions of what could happen concerning parents becoming more empowered in the relations between parents and teachers. While they found teachers had positive emotions toward involved parents they also saw the teachers were not fond of the higher levels of scrutiny. The authors found to successfully counter feelings of the empowered parents, teachers did best when increasing communication and transparency, allowing the parents to be confident in the teacher's skills. They found that formal policies of openness as well as increasing political orientations were a positive track for avoiding conflict and keeping control regarding the professionalism of their job. Addi-Raccah and Arviv-Elyashiv state this for their sample filled with teachers of a certain level of education from affluent areas and that different teachers in different areas could have different results.

Now let us turn to some case studies. Ouchi (2006) took three case studies of large school districts that went through decentralization over a 30-year period. The

researcher came to three main conclusions regarding decentralization. 1) It must grant schools freedom over their staff, schedule, and specific methods of teaching. 2) There should be minimum standards set by the central office as well as the state and federal education agencies as well as measured checks to ensure these standards are being upheld. 3) School performance should be made available to the public and this performance information should cover the fiscal information of the school. Galiani and Schargrodsky (2001) also looked at decentralization from the school to student relationship but instead of focusing on America focused on Argentina. The authors evaluate Argentina's secondary schools' decentralization program and how it affected the student's standardized test scores in the 1990s. Their findings were that decentralization for the most part is positive but that the advantages touted could be diluted if the province the school is located in is mismanaged. They also found that in cases of severe fiscal deficit the effect of decentralization could be negative.

Clark (1970) looks at British schools between the years of 1988 and 1997 looking into what transpired after Britain passed a law allowing public schools of a certain level to become autonomous without them losing their funding. But it was voted on by the parents and was not an option that the schools were able to decide by themselves. The researcher found there was a marked improvement in schools that decided to take advantage of the ability to become autonomous but failed to prove any improvement to neighboring schools or the community at large.

While Kvalsund (2008) is looking specifically at Norway in their article, there are interesting arguments made. Specifically regarding the argument that research alone will not provide the necessary information to answer the questions that are currently being proposed regarding the development of schools. Kvalsund goes on to argue for a school of thought that is more holistic. Believing that looking at multiple approaches, which for many issues, education included, find multiple possible solutions. The researcher is not arguing to do away with research but is rather making an argument for board members and policy makers to use research in a critical manner to create more knowledge based decision-making concerning schools as well as communities.

5. Empirical Model

In the baseline model I look at how parental dissatisfaction by parents *i* in school *j* located in country *k* is affected by the level of decentralization of decision-making at the school.

$$
\begin{aligned}
Parental\ Dissatisfaction_{ijk} &= \beta_0 + \beta_1 Decentralization\ of\ Decision-making\ at\ School_{jk} \\
&+ \beta_2 Polity_k + \beta_3 Private_{jk} + \beta_4 Professional\ Development_{jk} \\
&+ \beta_5 Teacher\ Certification_{jk} + \beta_6 Mothers\ Education_{ijk} \\
&+ \beta_7 Teacher's\ Education\ Levels_{jk} + \epsilon_{ijk}
\end{aligned}
\tag{1}
$$

Parental dissatisfaction is used as the dependent variable (rather than parental satisfaction), as an increase in score indicates that parents are more dissatisfied. A more robust discussion of the data will be given in the next section.

While the school-level of decentralization in decision-making is the key independent variable of interest, I also consider whether the national level of decentralization ($polity_k$) impacts parents' level of satisfaction. Therefore, I consider 'polity' to be a secondary independent variable of interest. Five control variables are also included in the benchmark equation: (1) whether the school is public or private, (2) the number of hours per school *j* that teachers underwent professional development activities, (3) count of full time teachers in school *j* that are certified by the appropriate authorities, (4) the number of years of education the maternal parent *i* of a child in school *j* has obtained, and (5) the highest level of education a child's teacher has obtained.

The dependent variable (as will be discussed in the next section) is ordered and categorical. Therefore, equation 1 is estimated at the parent level using an ordered probit model. Multilevel analysis is considered to account for the fact that the dependent variable is identified at the parent-level, while the key independent variables are identified at the school and national level (decentralization decision-making at the school and polity, respectively). Given the nesting structure of the equation, the dependent variable averaged at the school-level and equation (1) is re-estimated as a robustness check using OLS. This school-level estimation model will be expanded upon later in the paper.

5.1. Data & Variables

Data was obtained from Programme for International Student Assessment (PISA) for 2015. The PISA dataset is created through surveys distributed and coded by the OECD. There is a survey for schools, teachers, parents, and 15-year-old students which are distributed across many countries and across a random sample of children. For the models used in this paper answers from the parental survey, student survey, as well as the school survey were used. The Polity IV dataset is merged with the PISA data to look at decentralization at the country level. The countries included in the parent level equations are as follows: Italy, Korea, Macao, Portugal, Spain, and Chile. The countries included in the school level equations are the same except it doesn't include Chile as there was not enough variability to have adequate predictive power.

5.2.1. Parental Dissatisfaction

Parental dissatisfaction is a fuzzy, amorphous term that can be difficult to encapsulate in data. To best address this concern, three different topical areas related to parental dissatisfaction are considered: (1) whether parents rate standards of achievement as high in their child's school, (2) whether parents feel their child's school teachers are competent and dedicated, and (3) whether parents believe their child's school does a good job in educating students. Each of these different variables is treated as the dependent variable in three different estimations of equation (1) to ensure the robustness of my

results. All three of the dependent variables used to measure parental dissatisfaction are categorical data and the responses carry the same scaled meaning. More specifically, the three survey questions used to proxy parental dissatisfaction and the possible parental scoring responses are as follows:

$$Parental\ Dissatisfaction = \begin{cases} Standards\ of\ Achievement\ are\ high\ \ in\ my\ childs\ school \\ Most\ of\ my\ childs\ school\ teachers\ seem\ competent\ and\ dedicated \\ My\ childs\ school\ does\ a\ good\ job\ in\ educating\ students \end{cases}$$

$$Response\ options\ for\ the\ dependent\ variable = \begin{cases} 1 = Strongly\ agree \\ 2 = Agree \\ 3 = Disagree \\ 4 = Strongly\ Disagree \end{cases}$$

5.2.2. Decentralization of Decision-making at School

In the PISA school dataset, there are a set of questions related to the authority responsible for making decisions. These responses are provided by the school and are utilized to gain a better understanding of each school's decision-making structure. From these statements, I created an overall index of the level of decentralization of decision-making at each school.

Below is a list of each of the "decision areas" taken into consideration when constructing the Decentralization Index as well as the authority levels utilized to make these decisions.

$$Index\ Statements = \begin{cases} Selecting\ Teachers\ for\ Hire \\ Firing\ Teachers \\ Establishing\ Teacher's\ Starting\ Salaries \\ Determining\ Teachers'\ Salary\ Increases \\ Formulating\ the\ School\ Budget \\ Deciding\ on\ Budget\ Allocations\ Within\ the\ School \\ Estabilishing\ Student\ Disciplinary\ Policies \\ Establishing\ Student\ Assessment\ Policies \\ Approving\ Students\ for\ Admission\ to\ the\ School \\ Choosing\ Which\ Textbooks\ are\ Used \\ Determining\ Course\ Content \\ Deciding\ Which\ Courses\ are\ Offered \end{cases}$$

$$Levels\ Of\ Each\ Statement = \begin{cases} National\ Education\ Authority \\ Regional\ or\ Local\ Education\ Authority \\ School\ Governing\ Board \\ Principal \\ Teacher \end{cases}$$

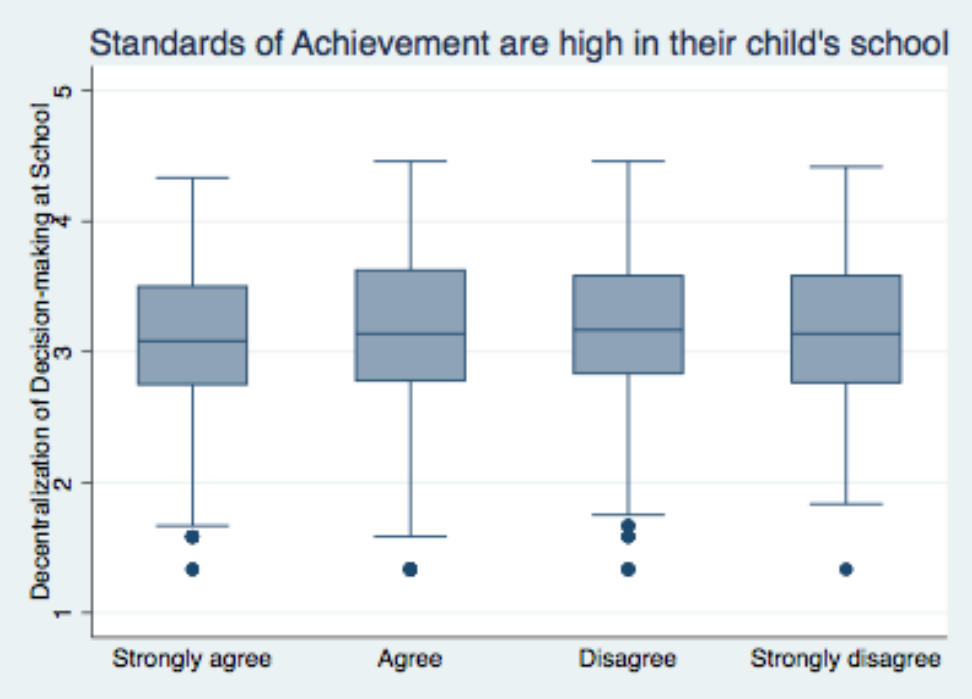
For every decision area, each potential decision-making authority receives a binary score of 0 or 1; 0 if the decision is not made at a particular level of authority and 1 if it is. An ordinal scaling system was then applied to each level of authority (for a visualization example look at equation (2) below).

The schools either checked, did not check, or left the response blank for each of the decision areas. Sometimes a school identified that multiple levels of authority were responsible for making a particular decision. In that case, an average authority level was computed. For clarity on how this was done, consider the decision of selecting a teacher to hire. The total authority score (e.g. 7 if a school identified that both the 'School Governing Board' *and* 'Principal' are responsible for making decision about hiring) is

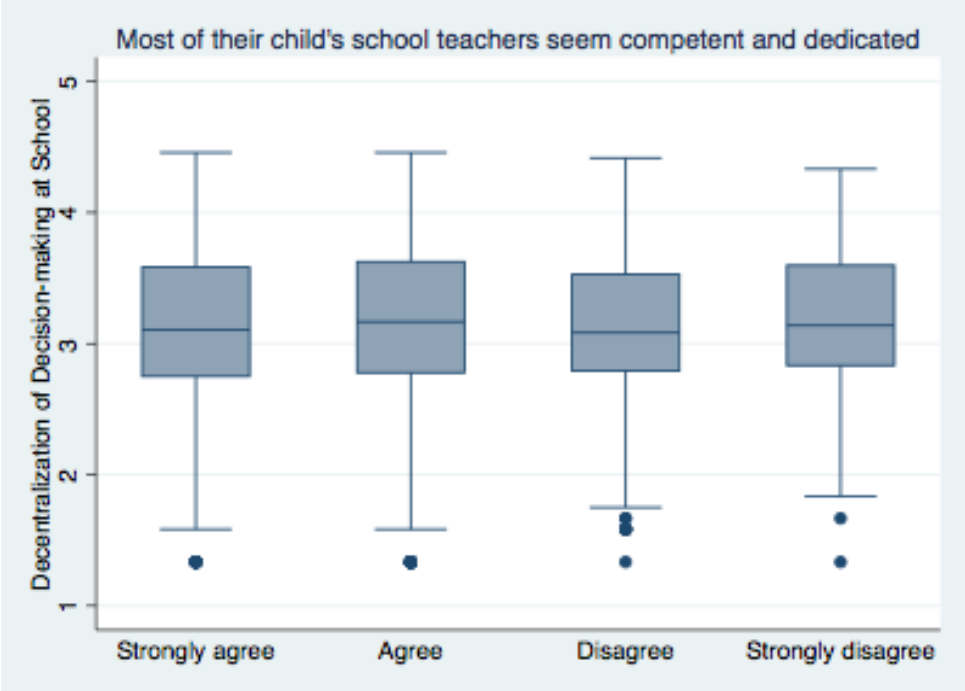
divided by the total possible score a school could have selected (i.e. 5, which would occur if every level of authority was selected as playing a role in making a particular decision). This averaging process is reflected in equation (2), below.

$$Selecting\ Teachers\ for\ Hire = \frac{\left(\begin{array}{c}(Selecting\ Teachers\ for\ Hire{:}National\ Education\ Authority*1)\\+\\(Selecting\ Teachers\ for\ Hire{:}Regional\ or\ Local\ Education\ Authority*2)\\+\\(Selecting\ Teachers\ for\ Hire{:}School\ Governing\ Board*3)\\+\\(Selecting\ Teachers\ for\ Hire{:}Principal*4)\\+\\(Selecting\ Teachers\ for\ Hire{:}Teacher*5)\end{array}\right)}{\begin{array}{c}Sum(Selecting\ Teachers\ for\ Hire{:}\ National\ Education\ Authority\\+\ Regional\ or\ Local\ Education\ authority\\+School\ Governing\ Board + Principal + Teacher)\end{array}} \quad (2)$$

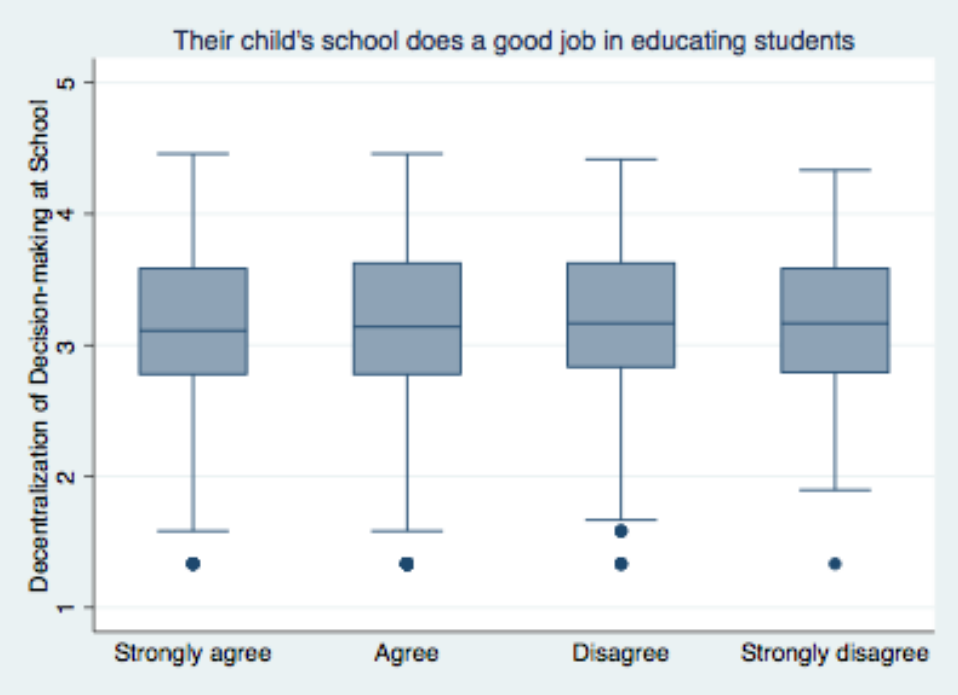
The averaging process results in a number between 1 and 5 for each decision area. Given that there are 12 school-related decisions being assessed, after a number was calculated for each of the 12 statements they were all added together and divided by 12 to get a solitary number for each school. The closer the number is to 5 the higher the level of decentralization (i.e. decision-making occurs more at the teacher and principal level) inversely, the closer the number is to 1 the lower the level of decentralization (i.e. decision-making occurs more at the national education authority level).



Graph 1



Graph 2



Graph 3

In Graphs 1, 2, and 3 the index, decentralization of decision-making at school is broken into smaller subsets. In Graph 1 the index looks at the equation using standards of achievement are high for the dependent variable sample and splits it into 4 smaller sub groups depending on the response to the dependent variable. This graph gives a visual of the mean, median, and max of the decentralization index depending on what type of a response was given by the parent. Graph 2 relays the same information for the dependent variable most of my child's school teachers seem competent and dedicated. Graph 3 relays the same information for the dependent variable my child's school does a good job in educating students.

5.2.3. Polity Scores

Polity scores, or the country level structural measures, work to encapsulate the regime authority spectrum on a 21-point scale which ranges from -10 to +10. It is built through the combination of the authority and democracy variables in the original dataset offered by the Systematic Peace Organization.

Democracy

Authority Coding	**Scale Weight**
Competitiveness of Executive Recruitment (XRCOMP):	
(3) Election	+2
(2) Transitional	+1
Openness of Executive Recruitment (XROPEN):	
only if XRCOMP is Election (3) or Transitional (2)	
(3) Dual/election	+1
(4) Election	+1
Constraint on Chief Executive (XCONST):	
(7) Executive parity or subordination	+4
(6) Intermediate category	+3
(5) Substantial limitations	+2
(4) Intermediate category	+1
Competitiveness of Political Participation (PARCOMP):	
(5) Competitive	+3
(4) Transitional	+2
(3) Factional	+1

(Jagger and Gurr 1995)

Autocracy

Authority Coding	**Scale Weight**
Competitiveness of Executive Recruitment (XRCOMP):	
(1) Selection	+2
Openness of Executive Recruitment (XROPEN):	
only if XRCOMP is coded Selection (1)	
(1) Closed	+1
(2) Dual/designation	+1
Constraints on Chief Executive (XCONST):	
(1) Unlimited authority	+3
(2) Intermediate category	+2
(3) Slight to moderate limitations	+1
Regulation of participation (PARREG):	

(4) Restricted +2
(3) Sectarian +1
Competitiveness of Participation (PARCOMP):
(1) Repressed +2
(2) Suppressed +1

(Jagger and Gurr 1995)

Polity Scores:

-10 **Hereditary monarchy** (Monarchy or a form of monarchy in which the sovereign power descends by right of inheritance.)

-9 ←→ -6 **Autocracies** (Government in which one person possesses unlimited power)

-5 ←→ +5 **Anocracies** (A political system which is neither fully democratic nor fully autocratic, often being vulnerable to political instability)

+6 ←→ +9 **Democracies** (government by the people)

+10 **Consolidated Democracy** (A political system where it is expected to endure)

Polity Scores are formally a part of the Polity IV Project made available by the Center for Systematic Peace. Data on polity scores is attainable for 167 countries and are part of a constantly monitored dataset that provides annual assessments of changes/updates to regime authorities.

Because the polity scores had different country identification codes in it than the PISA data, the merge required some hand coding to align each country's score with the correct country code. This was done by creating a variable called polity and hand coding the connections between the country id of the PISA dataset and the country id of the polity dataset. As polity scores were at the country level they are consistent through both the school-level equation and the parent-level equation.

While polity scores are not perfect measures of national decentralization it is an often used and cited dataset useful for studying the global and regional statuses of democratization. One such research paper is from Jaggers's and Gurr's (1995) in which not only is the third iteration of the data set analyzed but it is reported upon.

5.2.4. Control Variables

In equation (1) there are 5 control variables: private notates if a school *i* is a public (= 1) or private (= 2) institution. Professional development is the number of hours per school *i* that teachers underwent professional development activities. Teacher certification is a count of full time teachers in school *i* that are certified by the appropriate authorities. Mother's education is the number of years of education by levels that mothers with children in school *i* have obtained. Teacher's education levels which are measured in school *i,* captures the number of years of education by levels that teachers in school *i* have obtained (Further Description in Appendix 2). These variables come from the PISA school survey, teacher survey and parent survey, and are visually represented in Appendix 1 with full explanations of the variables mapped out in Appendix 1.

6. Benchmark Results (Parent-Level Analysis)

The method used for this equation is an ordered probit and the observational unit would be parent (*i*) with a child in school (*j*) located in country (*k*).

6.1. Descriptive Statistics

Tables 1 - 3 show descriptive statistics for the full sample of student level data. Through the three tables you can reference the slight differences in the sample size for the three dependent variables. In all three of the tables the variable: decentralization of decision-making at school has a mean greater than 3 with a possible scale of 1-5. This means that schools are generally more decentralized in this sample. While the variable: polity the table has a mean greater than 6 with a possible scale of -10 to +10. This means that countries are generally more decentralized in this sample.

Table 1: Summary Statistics Table For Parent Level Variables Equation 1

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.19	0.58	23,826	1	4
Polity	6.60	6.38	23,826	-7	10
Private School	1.43	0.50	23,826	1	2
Teacher Professional Development	1.40	0.22	23,826	1	2
Teacher Certification	75.21	61.60	23,826	0	342
Mother's Education	3.72	1.73	23,826	0	6
Teacher's Education Levels	3.24	0.60	23,826	1	5
Standards of Achievement Are high in their child's School	2.03	0.67	23,826	1	4

Table 1 describes the descriptive statistics for the parent level variables utilizing the equation 1 dependent variable, Standards of Achievement are high in their child's school. In this table there are three variables that I would like to focus on: the dependent variable as well as the two variables of interest, decentralization of decision-making at school and polity. Standards of Achievement are high in their child's school has the full fluctuation of values in the sample with the min at 1 and the max at 4. Because the mean is around 2.03 we can gather that parents are leaning towards agreeing with the statement vs disagreeing with the statement "standards of achievement are high in my child's school." Decentralization of decision-making at school has a min of 1 and a max of 4 so in this sample there are no perfect 5 schools or schools that are maximally decentralized. With a mean of around 3.19 the decentralization index is slightly more decentralized than it is centralized in the sample. Polity has a min of -7 with a max of 10 so in this sample there are no countries that hit the full -10 side of the scale. Because the mean of polity is around 6.60 we can see that the sample leans more towards countries labeled as democracy.

Table 2: Summary Statistics Table For Parent Level Variables Equation 2

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.19	0.58	23,896	1.33	4.46
Polity	6.60	6.38	23,896	-7	10
Private School	1.43	0.50	23,896	1	2
Teacher Professional Development	1.40	0.22	23,896	1	2
Teacher Certification	75.18	61.54	23,896	0	342
Mother's Education	3.72	1.73	23,896	0	6
Teacher's	3.24	0.60	23,896	1	5

Education Levels					
Most of their child's school Teachers seem competent and Dedicated	1.82	0.61	23,896	1	4

Table 2 describes the descriptive statistics for the parent level variables utilizing the equation 2 dependent variable, Most of their child's school teachers seem competent and dedicated. In this table there are three variables that I would like to focus on: the dependent variable as well as the two variables of interest, decentralization of decision-making at school and polity. Most of their child's school teachers seem competent and dedicated has the full fluctuation of values in the sample with the min at 1 and the max at 4. Because the mean is around 1.82 we can gather that parents are leaning towards agreeing with the statement vs disagreeing with the statement "most of their child's school teachers seem competent and dedicated", with this mean being smaller than the mean from the dependent variable for equation 1. Decentralization of decision-making at school has a min of 1.33 and a max of 4.46 so in this sample there are no perfect 5 schools or schools that are maximally decentralized even though the min and max are elevated over what was seen in equation 1. With a mean of around 3.19 the decentralization index is slightly more decentralized than it is centralized in the sample with this mean being very similar to what is seen in equation 1. The polity variable min max and mean are all almost exactly the same as what was returned in equation 1.

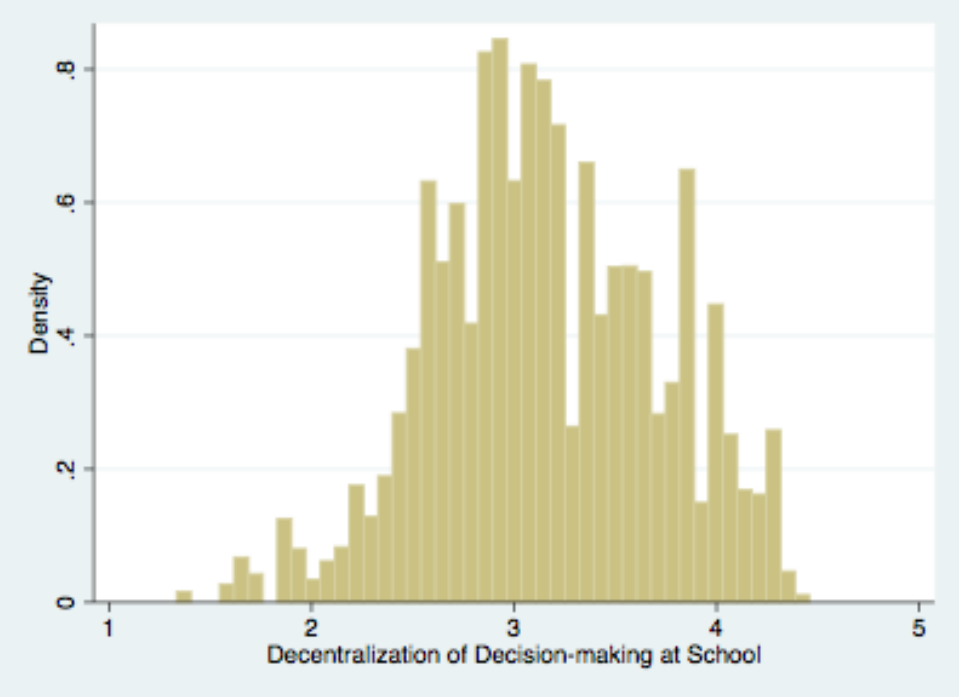
Table 3: Summary Statistics Table For Parent Level Variables Equation 3

Variable	Mean	Standard Deviation	N	min	max
Decentralization of	3.19	0.58	23,851	1.33	4.46

Decision-making at School					
Polity	6.60	6.38	23,851	-7	10
Private School	1.43	0.50	23,851	1	2
Teacher Professional Development	1.40	0.22	23,851	1	2
Teacher Certification	75.20	61.61	23,851	0	342
Mother's Education	3.72	1.73	23,851	0	6
Teacher's Education Levels	3.24	0.60	23,851	1	5
Their Child's School Does a good job in educating students	1.85	0.59	23,851	1	4

Table 3 describes the descriptive statistics for the parent level variables utilizing the equation 2 dependent variable, Their child's school does a good job in educating students. In this table there are three variables that I would like to focus on: the dependent variable as well as the two variables of interest, decentralization of decision-making at school and polity. Their child's school does a good job in educating students has the full fluctuation of values in the sample with the min at 1 and the max at 4. Because the mean is around 1.85 we can gather that parents are leaning towards agreeing with the statement vs disagreeing with the statement "their child's school does a good job in educating students", with this mean being very similar to the dependent variable for equation 2. Decentralization of decision-making at school has a min of 1.33 and a max of 4.46 which is very similar to what was seen in equation 2. With a mean of around 3.19 the decentralization index is slightly more decentralized than it is centralized in the sample with this mean being very similar to what is seen in equation 2. The polity

variable min max and mean are all almost exactly the same as what was returned in equation 2.



Graph 4

Graph 4 illustrates a histogram of the decentralization of decision making at school index. This gives a visual describing the index's distribution of values to give more context on the index before launching into results. As can be seen in the histogram the majority of values hovering around 3 which is slightly above the halfway mark meaning the value is more likely to lean towards decentralization.

6.2. Results

6.2.1. Ordered Probit

I estimate the benchmark equation (1) using an ordered probit to gain more insights into the ordered levels of the dependent variables (i.e. whether parents strongly agree, agree, disagree, or strongly disagree with the statement of parental satisfaction). Equation (1) is estimated using the three different dependent proxies for parental satisfaction mentioned earlier; Table 5 looks at parental responses to whether standards of achievement are high at their child's school; Table 6 looks at parental responses to whether most of teachers at their child's school are competent and dedication; Table 7 looks at parental responses to whether the child's school does a good job of educating students.

Table 4

In the ordered probit equations detailed in Table 4, I look at how the likelihood parental dissatisfaction changes using their level of agreement to the statement that standards of achievement are high in their child's school. In column 1 both the level of decentralization of decision-making at school and polity are included as independent variables. In column 2 the level of decentralization of decision-making at school and polity are interacted and included as an additional regressor. In column 3 the level of decentralization of decision-making at school is the only variable of interest in the equation. In column 4 polity is the only variable of interest in the equation.

Table 4: Ordered Probit for Equation 1 - Standards of Achievement are high in their child's school

	1	2	3	4
Decentralization of Decision-making at school	0.12*** (0.02)	0.14*** (0.03)	0.20*** (0.02)	
Polity	-0.02*** (0.00)	-0.02 (0.01)		-0.02*** (0.00)
Private School	-0.31*** (0.02)	-0.31*** (0.02)	-0.26*** (0.02)	-0.24*** (0.02)
Teacher Certification	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Teacher Education level 2	-0.07 (0.09)	-0.07 (0.09)	-0.05 (0.09)	-0.09 (0.09)
Teacher Education level 3	-0.08 (0.07)	-0.08 (0.07)	-0.05 (0.07)	-0.09 (0.07)
Teacher Education level 4	-0.00 (0.07)	-0.00 (0.08)	0.04 (0.07)	-0.01 (0.07)
Teacher Education level 5	-0.08 (0.08)	-0.08 (0.08)	-0.09 (0.08)	-0.10 (0.08)
Teachers years of Professional development	0.11** (0.04)	0.11** (0.04)	-0.01 (0.04)	0.11** (0.04)
Mother's education level 1	-0.13** (0.05)	-0.13** (0.05)	-0.10* (0.05)	-0.13** (0.05)
Mother's education level 2	-0.12** (0.04)	-0.12** (0.04)	-0.12** (0.04)	-0.11* (0.04)
Mother's education level 3	-0.07 (0.05)	-0.07 (0.05)	-0.10* (0.05)	-0.06 (0.05)
Mother's education level 4	-0.12** (0.04)	-0.12** (0.04)	-0.15*** (0.04)	-0.11* (0.04)
Mother's education level 5	-0.10* (0.05)	-0.10* (0.05)	-0.14** (0.05)	-0.08 (0.05)
Mother's education level 6	-0.23*** (0.04)	-0.23*** (0.04)	-0.29*** (0.04)	-0.21*** (0.04)

Interaction between Decentralization and polity		-0.00 (0.00)		
cut1				
Constant	-1.23*** (0.12)	-1.18*** (0.15)	-0.87*** (0.11)	-1.57*** (0.10)
cut2				
Constant	0.52*** (0.12)	0.57*** (0.15)	0.87*** (0.11)	0.18 (0.10)
cut3				
Constant	1.77*** (0.12)	1.82*** (0.15)	2.12*** (0.11)	1.42*** (0.10)
Observations	23826	23826	23826	23826

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001
Table 4 - Column 1

In column 1 the results are as follows: the level of decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher. Polity moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher

certification moves in the opposite direction as the dependent variable and is significant at the 0.1% level. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more negative as the level of education increases. This suggests that mothers with more education are less dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 4 - Column 2

In column 2 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization

the parents rate their dissatisfaction higher. Polity moves in the opposite direction as the dependent variable. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher. The interaction term between decentralization of decision-making and polity moves in the opposite direction as the dependent variable and is not statistically significant. What this tells us is that there is overlap between the polity score and decentralization of decision-making at school to be considered.

The control variables also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the opposite direction as the dependent variable and is significant at the 0.1% level. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various

levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more negative as the level of education increases. This suggests that mothers with more education are less dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 4 - Column 3

In column 3 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher.

The control variables also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the opposite direction as the dependent variable and is significant at the 0.1% level. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the

variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more negative as the level of education increases. This suggests that mothers with more education are less dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 4 - Column 4

In column 4 the results are as follows: polity moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less

dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the opposite direction as the dependent variable and is significant at the 0.1% level. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more negative as the level of education increases. This suggests that mothers with more education are less dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 5

In the ordered probit equations detailed in Table 5 I am looking at how the likelihood of parental satisfaction changes, using the variable Most of their Child's

School Teachers Seem Competent and Dedicated, in relation to the variables Decentralization of Decision-making at school and polity scores. In equation 1 both decentralization of decision-making at school and polity are included. In equation 2 decentralization of decision-making at school and polity are interacted. In equation 3 decentralization of decision-making at school is the only variable of interest in the equation. In equation 4 polity is the only variable of interest in the equation.

Table 5: Ordered Probit for Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated

	1	2	3	4
Decentralization of Decision-making at school	0.10*** (0.02)	0.11*** (0.03)	0.18*** (0.02)	
Polity	-0.02*** (0.00)	-0.01 (0.01)		-0.02*** (0.00)
Private School	-0.32*** (0.02)	-0.32*** (0.02)	-0.26*** (0.02)	-0.27*** (0.02)
Teacher Certification	-0.00 (0.00)	-0.00 (0.00)	0.00*** (0.00)	-0.00 (0.00)
Teacher Education level 2	0.01 (0.10)	0.01 (0.10)	0.04 (0.10)	0.00 (0.10)
Teacher Education level 3	0.07 (0.08)	0.07 (0.08)	0.09 (0.08)	0.05 (0.08)
Teacher Education level 4	0.14 (0.08)	0.14 (0.08)	0.18* (0.08)	0.13 (0.08)
Teacher Education level 5	0.01 (0.09)	0.01 (0.09)	-0.00 (0.08)	-0.01 (0.08)
Teachers years of Professional development	0.10* (0.04)	0.10* (0.04)	-0.03 (0.04)	0.10* (0.04)
Mother's education level 1	-0.02 (0.05)	-0.02 (0.05)	0.01 (0.05)	-0.02 (0.05)

Mother's education level 2	0.00 (0.05)	0.00 (0.05)	-0.00 (0.05)	0.01 (0.05)
Mother's education level 3	0.10 (0.05)	0.10 (0.05)	0.06 (0.05)	0.10 (0.05)
Mother's education level 4	0.11* (0.05)	0.11* (0.05)	0.08 (0.05)	0.12** (0.05)
Mother's education level 5	0.11* (0.05)	0.11* (0.05)	0.07 (0.05)	0.12* (0.05)
Mother's education level 6	0.03 (0.05)	0.03 (0.05)	-0.03 (0.05)	0.04 (0.05)
Interaction between Decentralization and polity		-0.00 (0.00)		
cut1 Constant	-0.66*** (0.12)	-0.58*** (0.16)	-0.28* (0.12)	-0.92*** (0.11)
cut2 Constant	1.34*** (0.12)	1.43*** (0.16)	1.72*** (0.12)	1.09*** (0.11)
cut3 Constant	2.16*** (0.12)	2.25*** (0.16)	2.54*** (0.12)	1.91*** (0.11)
Observations	23896	23896	23896	23896

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 5 - Column 1

In column 1 the results are as follows decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher. Polity moves in the opposite direction as the

dependent variable and is statistically significant at the 0.1% level. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 5% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's

education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 5 - Column 2

In column 2 the results are as follows decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher. Polity moves in the opposite direction as the dependent variable and is not statistically significant. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher. The interaction term between decentralization of decision-making and polity moves in the opposite direction as the dependent variable and is not statistically significant. What this tells us is that there is overlap between the polity score and decentralization of decision-making at school to be considered.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below

ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 5% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 5 - Column 3

In column 3 the results are as follows decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1%

level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the same direction as the dependent variable and is significant at the 0.1% level. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant except for Teacher's education at level 4, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the opposite direction as the dependent variable and is not statistically significant. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 5 - Column 4

In column 4 the results are as follows polity moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 5% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases.

This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 6

In the ordered probit equations detailed in Table 6 I am looking at how the likelihood of parental satisfaction changes, using the variable Their Child's School does a good job in educating students, in relation to the variables Decentralization of Decision-making at school and polity scores. In equation 1 both decentralization of decision-making at school and polity are included. In equation 2 decentralization of decision-making at school and polity are interacted. In equation 3 decentralization of decision-making at school is the only variable of interest in the equation. In equation 4 polity is the only variable of interest in the equation.

Table 6: Ordered Probit for Equation 3 - Their Child's School does a good job in educating students

	1	2	3	4
Decentralization of Decision-making at school	0.06** (0.02)	0.11*** (0.03)	0.18*** (0.02)	
Polity	-0.03*** (0.00)	-0.01 (0.01)		-0.03*** (0.00)
Private School	-0.28*** (0.02)	-0.28*** (0.02)	-0.19*** (0.02)	-0.24*** (0.02)
Teacher Certification	0.00 (0.00)	0.00 (0.00)	0.00*** (0.00)	-0.00 (0.00)

Teacher Education level 2	-0.11 (0.10)	-0.11 (0.10)	-0.07 (0.10)	-0.12 (0.10)
Teacher Education level 3	0.01 (0.08)	0.01 (0.08)	0.03 (0.08)	-0.00 (0.08)
Teacher Education level 4	0.11 (0.08)	0.12 (0.08)	0.17* (0.08)	0.11 (0.08)
Teacher Education level 5	0.01 (0.08)	0.01 (0.08)	-0.01 (0.08)	-0.00 (0.08)
Teachers years of Professional development	0.30*** (0.04)	0.30*** (0.04)	0.13*** (0.04)	0.30*** (0.04)
Mother's education level 1	-0.06 (0.05)	-0.06 (0.05)	-0.02 (0.05)	-0.06 (0.05)
Mother's education level 2	-0.01 (0.05)	-0.01 (0.05)	-0.02 (0.05)	-0.01 (0.05)
Mother's education level 3	0.05 (0.05)	0.05 (0.05)	0.00 (0.05)	0.06 (0.05)
Mother's education level 4	0.07 (0.05)	0.08 (0.05)	0.03 (0.05)	0.08 (0.05)
Mother's education level 5	0.12* (0.05)	0.12** (0.05)	0.06 (0.05)	0.13** (0.05)
Mother's education level 6	0.04 (0.05)	0.04 (0.05)	-0.05 (0.05)	0.04 (0.05)
Interaction between Decentralization and polity		-0.01* (0.00)		
cut1 Constant	-0.58*** (0.12)	-0.39* (0.16)	-0.06 (0.12)	-0.75*** (0.11)
cut2 Constant	1.47*** (0.12)	1.66*** (0.16)	1.97*** (0.12)	1.30*** (0.11)
cut3 Constant	2.37*** (0.12)	2.57*** (0.16)	2.88*** (0.12)	2.21*** (0.11)
Observations	23851	23851	23851	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table 6 - Column 1

In column 1 the results are as follows decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher. Polity moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction

as the dependent variable and is statistically significant at the 0.1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 6 - Column 2

In column 2 the results are as follows decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher. Polity moves in the opposite direction as the dependent variable and is not statistically significant. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher. The interaction term between decentralization of decision-making and polity moves in the opposite direction as the dependent variable and is statistically significant at the 5% level. What this tells us is that there is overlap between the polity score and decentralization of decision-making at school to be considered.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 6 - Column 3

In column 3 the results are as follows decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as schools move towards decentralization the parents rate their dissatisfaction higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the same direction as the dependent variable and is significant at the 0.1% level. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant except for Teacher's Education at level 4, suggesting that higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend,

overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

Table 6 - Column 4

In column 4 the results are as follows polity moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that as the country moves in the direction of centralization parent's rate their dissatisfaction as higher.

The control variable also provide interesting insight. Private moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that parents with children attending private schools are less dissatisfied, relative to parents who send their children to public schools. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. This results is as one would expect; parental dissatisfaction is lower in schools with a greater quantity of certified teachers. Teacher's education is comprised of a series of dummy variables for various levels of education. Level 1 (below ISCED Level 5 – 'short cycle tertiary education') is the omitted comparison group. None of the variables on teacher's education level are statistically significant, suggesting that

higher levels of educational attainment by teachers do not impact the level of parental dissatisfaction. Teacher's years of professional development moves in the same direction as the dependent variable and is statistically significant at the 0.1% level. This suggests that the more years a teacher spends on developing their craft, the more dissatisfied parents are. Mother's education is comprised of a series of dummy variables for various levels of education attained. Level 0, or no formal education, is the omitted comparison group. Although there is no consistent trend, overall the coefficient on the set of mother's education variables becomes more positive as the level of education increases. This suggests that mothers with more education are more dissatisfied with their child's education. This could be because more education mothers are better at placing their child in schools that meet the family's educational expectations.

6.2.2. Marginal Effects

As stated previously equation (1) was estimated using three separate dependent variables, each approximating parental dissatisfaction. Table 7 provides the marginal effects for column 1 of Tables 4 through 6. Marginal effects allow the coefficients on the ordered probit to be interpreted at mean values of the independent variables.

Table 7: Marginal Effects of Ordered Probits

	1=Strongly Agree	2=Agree	3=Disagree	4=Strongly Disagree
Equation 1 - Standards of Achievement are high in their child's school				
Observations	23826	23826	23826	23826

Decentralization of Decision-making at school	-0.03*** (0.01)	-0.00*** (0.00)	0.03*** (0.00)	0.01*** (0.00)
Polity	0.01*** (0.00)	0.00*** (0.00)	-0.01*** (0.00)	-0.00*** (0.00)
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated				
Observations	23896	23896	23896	23896
Decentralization of Decision-making at school	-0.03*** (0.01)	0.02*** (0.00)	0.01*** (0.00)	0.00*** (0.00)
Polity	0.01*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
Equation 3 - Their Child's School does a good job in educating students				
Observations	23851	23851	23851	23851
Decentralization of Decision-making at school	-0.02** (0.01)	0.01** (0.00)	0.01** (0.00)	0.00** (0.00)
Polity	0.01*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The marginal effects for column 1 of Table 4 are reported in Table 7 Equation 1 and can be interpreted as follows: For parents who rate the dependent variable with a strongly agree response (as in the parent strongly agrees that standards of achievement in the school are high) a one unit increase in the decentralization index decreases their probability of strongly agreeing by 3.3% (at the 0.1% significance level). For parents who rate the dependent variable with an agree response, a one unit increase in the decentralization index decreases their probability of agreeing by 0.2% (at the 0.1% significance level). For parents who rate the dependent variable with a disagree response,

a one unit increase in the decentralization index increases their probability of disagreeing by 2.9% (at the 0.1% significance level). For parents who rate the dependent variable with a strongly disagree response, a one unit increase in the decentralization index increases their probability of strongly disagreeing by 0.6% (at the 0.1% significance level). In all, this suggests that greater decentralization in educational decision making leads parents to less likely to agree (and more likely to disagree) that standards of achievement are high at their child's school.

Contrastingly, when assessing whether parents agree or disagree with the statement that standards of achievement at their child's school is high, the marginal effect for the polity variable transitions from being more positive to being more negative. This suggests that the more democratic a country, the more likely they are to agree that standards of achievement are high (and the less likely they are to disagree).

The marginal effects for column 1 of Table 5 are reported in Table 7 Equation 2 and can be interpreted as follows: For parents who rate the dependent variable with a strongly agree response (as in the parent strongly agrees most of their child's school teachers seem competent and dedicated in the school are high) decreases their probability being satisfied with a decentralized school by 3.0% (at the 0.1% significance level). For parents who rate the dependent variable with an agree response increases their probability of being satisfied with a decentralized school by 1.6% (at the 0.1% significance level). For parents who rate the dependent variable with a disagree response increases their probability of being satisfied with a decentralized school by 1.1% (at the 0.1%

significance level). For parents who rate the dependent variable with a strongly disagree response increases their probability of being satisfied with a decentralized school by 0.3% (at the 0.1% significance level). In all, this suggests that greater decentralization in educational decision making leads parents to less likely to agree (and more likely to disagree) that most of their child's school teacher seem competent and dedicated at their child's school.

Contrastingly, when assessing whether parents agree or disagree with the statement that standards of achievement at their child's school is high, the marginal effect for the polity variable transitions from being more positive to being more negative. This suggests that the less democratic a country, the less likely they are to agree that standards of achievement are high (and the more likely they are to disagree).

The marginal effects for column 1 of Table 6 are reported in Table 7 Equation 3 and can be interpreted as follows: For parents who rate the dependent variable with a strongly agree response (as in the parent strongly agrees their child's school does a good job in educating students are high) decreases their probability being satisfied with a decentralized school by 1.9% (at the 5% significance level). For parents who rate the dependent variable with an agree response increases their probability of being satisfied with a decentralized school by 0.9% (at the 5% significance level). For parents who rate the dependent variable with a disagree response increases their probability of being satisfied with a decentralized school by 0.7% (at the 5% significance level). For parents who rate the dependent variable with a strongly disagree response increases their

probability of being satisfied with a decentralized school by 0.2% (at the 5% significance level). In all, this suggests that greater decentralization in educational decision making leads parents to less likely to agree (and more likely to disagree) that most of their child's school teacher seem competent and dedicated at their child's school.

Contrastingly, when assessing whether parents agree or disagree with the statement that standards of achievement at their child's school is high, the marginal effect for the polity variable transitions from being more positive to being more negative. This suggests that the less democratic a country, the less likely they are to agree that standards of achievement are high (and the more likely they are to disagree).

6.2.3. Multilevel Ordered Probit Model

In this model I look at how the hierarchical nature of the data could influence the results of the equations, specifically zeroing in on where the variables decentralization of decision-making and polity are influenced. I wanted to look at this type of model due to the natural nested qualities of the data: country (polity scores) to school (level of decentralized decision-making behavior) to parent (reported level of dissatisfaction).

Table 8: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction interacting polity and decentralization of decision-making at school

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.25* (0.11)	0.17* (0.07)	0.17 (0.09)

Polity	0.06	0.04	0.04
	(0.04)	(0.03)	(0.04)
Decentralization of Decision-making at School Interacted with Polity	-0.02*	-0.02*	-0.02*
	(0.01)	(0.01)	(0.01)
Private	-0.34***	-0.30***	-0.33***
	(0.05)	(0.04)	(0.05)
Teacher Certification	-0.00**	0.00*	0.00
	(0.00)	(0.00)	(0.00)
Teacher Education Level 2	0.03	0.06	-0.15
	(0.10)	(0.10)	(0.10)
Teacher Education Level 3	-0.03	0.07	-0.10
	(0.08)	(0.08)	(0.08)
Teacher Education Level 4	-0.04	0.10	-0.07
	(0.08)	(0.08)	(0.09)
Teacher Education Level 5	0.05	0.07	-0.05
	(0.09)	(0.09)	(0.09)
Teachers years of Professional development	0.015	0.07	0.17*
	(0.08)	(0.06)	(0.07)
Mother's Education Level 1	-0.14**	-0.03	-0.04
	(0.05)	(0.05)	(0.05)
Mother's Education Level 2	-0.16***	-0.05	-0.03
	(0.05)	(0.05)	(0.05)
Mother's Education Level 3	-0.09	0.01	0.01
	(0.05)	(0.05)	(0.05)
Mother's Education Level 4	-0.14**	0.01	0.03
	(0.05)	(0.05)	(0.05)
Mother's Education Level 5	-0.14**	-0.03	0.02
	(0.05)	(0.05)	(0.05)
Mother's Education Level 6	-0.13**	-0.01	0.07
	(0.05)	(0.05)	(0.05)
cut1			
Constant	-0.93*	-0.35	-0.54
	(0.42)	(0.31)	(0.37)

cut2			
Constant	0.97*	1.73***	1.62***
	(0.42)	(0.31)	(0.37)
cut3			
Constant	2.31***	2.56***	2.56***
	(0.42)	(0.31)	(0.37)
Observations	23826	23896	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

In equation 1 the results are as follows: the level of decentralization of decision-making at a school moves in the same direction as the dependent variable (i.e. parental dissatisfaction as measured by responses to the question of whether standards of achievement at the child's school is high) and is statistically significant at the 5% level. This can be interpreted as parental dissatisfaction being greater at higher levels of decentralization in school decision-making. Polity moves in the same direction as the dependent variable suggesting that it has no independent impact on parental dissatisfaction. The interaction term between decentralization of decision-making and polity is negative and is statistically significant at the 5% level. This means that higher polity scores mediate to ameliorate parental dissatisfaction that occurs as schools utilize more decentralized decision-making.

In equation 2 the results are as follows: the level of decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 5% level. Polity moves in the same direction as the

dependent variable. This can be interpreted as parental dissatisfaction being greater at higher levels of decentralization in school decision-making. Polity moves in the same direction as the dependent variable suggesting that it has no independent impact on parental dissatisfaction. The interaction term between decentralization of decision-making and polity moves in the opposite direction as the dependent variable and is statistically significant at the 5% level. This means that higher polity scores mediate to ameliorate parental dissatisfaction that occurs as schools utilize more decentralized decision-making.

In equation 3 the results are as follows: the level of decentralization of decision-making at school moves in the same direction as the dependent variable but is not statistically significant. Polity moves in the same direction as the dependent variable but is not statistically significant. The interaction term between decentralization of decision-making and polity, moves in the opposite direction as the dependent variable and is statistically significant at the 5% level. Because the variables were not statistically significant alone it can be interpreted that it is only in the combination of the two is there an impact on the dependent variable. The two variables that came together to make this interaction can be assumed to have overlap which is why they are not significant alone.

6.3. Contextual Results of Parent Level

Through the parent level results there is a dissonance that is seen time and time again where the decentralization index and polity variables are moving in opposite

directions in relation to the dependent variable. The results so far are showing parents being more dissatisfied with schools that have more highly decentralized decision-making structures.

7. School Level Analysis

In this section, I address the nested nature of the data in a different way. Specifically, I average all of the parent-level variables (i.e. parental dissatisfaction and mother's education) to the school level, so that I can have a direct comparison of two school level variables. Namely, I look at how a school's level of decentralization in decision-making impacts the school's average level of parental dissatisfaction. Averaging the dependent variable (parental dissatisfaction) alters its properties such that rather than being an ordered categorical variable, it is now a continuous variable that can take values between 1 and 4. Therefore, the method used to assess equation (1) at the school-level is ordinary least squares.

To get the data for the school level model into a unified format and at the same level the variables from the parental or student survey were averaged together to be at the school level and combined with the school variables to bring the data together into the same dataset. For the parent level model the data points were taken as is. From several of the school level variables, I processed them to create an Index that would give a better look into the level of decentralization in decision-making at any given school, this process is delved into more deeply in the Decentralization of Decision-making at School

section. The most recent year of the Polity IV dataset was then combined with the above data sets so we could use the country level polity score in the equation.

7.1. Descriptive Statistics School Level

Table 9 shows descriptive statistics for the full sample of school level data. Compared to the student level descriptive statistics, the school level has much fewer observations available both from the dataset. This dataset visualizes slight differences in the three variables used for the dependent variable equations as well as the dramatically different spread of the data between the variables: decentralization of decision-making at school and polity.

Table 9: Summary Statistics Table For School Level Variables

Variable	Mean	Standard Deviation	N	min	max
Decentralization of Decision-making at School	3.07	0.53	886	1.33	4.46
Polity	8.83	3.73	886	-7	10
Private School	1.31	0.46	886	1	2
Teacher Professional Development	1.44	0.23	886	1	2
Teacher Certification	64.21	57.58	886	0	342
Average Mother's Education	3.81	0.93	886	0.67	5.93
Average Teacher's Education Levels	3.20	0.26	886	2	4.07
Average Standards of Achievement Are high in their child's School	2.04	0.27	886	1.13	3.13

Average Most of their child's school Teachers seem competent and Dedicated	1.82	0.20	886	1	2.75
Average Their Child's School Does a good job in educating students	1.83	0.22	886	1	2.63

7.2. Ordinary Least Squares Results

Table 10: OLS estimation of Parental Dissatisfaction-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.10***	0.05**	0.04*
	(0.02)	(0.02)	(0.02)
polity	-0.01***	-0.01***	-0.02***
	(0.00)	(0.00)	(0.00)
Private	-0.17***	-0.20***	-0.16***
	(0.03)	(0.02)	(0.02)
Teacher Professional Development	0.07	0.05	0.11***
	(0.04)	(0.03)	(0.03)
Teacher Certification	-0.00***	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
Average Mother's Education	-0.06***	0.02*	-0.01
	(0.01)	(0.01)	(0.01)
Average Teacher's Education Levels	0.02	0.03	0.11***
	(0.04)	(0.03)	(0.03)
Constant	2.17***	1.84***	1.57***
	(0.14)	(0.10)	(0.11)
Observations	886	886	886

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 10 equation 1 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 1% level. Polity moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher Professional Development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. Average Mother's Education moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher's education Levels moves in the same direction as the dependent variable and is not statistically significant.

Going in order the findings can be described as follows. The higher the level of decentralization of decision-making at schools the more dissatisfied parents are with the Standards of Achievement at their child's school. This meaning that the more decentralized school-level decision making country is the worse the parents rated their satisfaction, this point being supported by Vexliard (1970). The lower the score of polity, or the farther away from democracy, the higher the parents rated the Standards of Achievement being high at their child's school which is in line with Vexliard (1970) and his findings. The lower the score of Private (the more likely the school is public rather than private) the higher the parents rated the Standards of Achievement being high at their child's school. The higher the level of Teacher professional development reported

by the school the higher the parents rated the Standards of Achievement being high at their child's school. The lower the number of certified teachers at the school the higher the parents rated the Standards of Achievement being high at their child's school. The lower the number of average years of mother's education per school the higher the parents rated the Standards of Achievement being high at their child's school. The higher the number of teacher's education levels by school the higher the parents rated the Standards of Achievement being high at their child's school.

For Table 10 equation 2 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 1% level. Polity moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher Professional Development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. Average Mother's Education moves in the same direction as the dependent variable and is statistically significant at the 5% level. Teacher's education Levels moves in the same direction as the dependent variable and is not statistically significant.

Going in order the findings can be described as follows. The higher the level of decentralization of decision-making at schools the more apt parents are to disagree that most of their Child's School Teachers Seem Competent and Dedicated. This means that

the more decentralized school-level decision-making is, the worse the parents rated their satisfaction. The lower the score of polity, or the farther away from democracy, the higher the parents rated the Standards of Achievement being high at their child's school. The lower the score of Private (the more likely the school is public rather than private) the higher the parents rated most of their Child's School Teachers Seem Competent and Dedicated. The higher the level of Teacher professional development reported by the school the higher the parents rated most of their Child's School Teachers Seem Competent and Dedicated. The lower the number of certified teachers at the school the higher the parents rated the Standards of Achievement being high at their child's school. The higher the number of average years of mother's education per school the higher the parents rated most of their Child's School Teachers Seem Competent and Dedicated. The higher the number of teacher's education levels by school the higher the parents rated most of their Child's School Teachers Seem Competent and Dedicated.

For Table 10 equation 3 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 5% level. Polity moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher Professional Development moves in the same direction as the dependent variable and is statistically significant at the 1% level. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. Average Mother's Education moves in the opposite direction as the dependent variable and is not

statistically significant. Teacher's education Levels moves in the same direction as the dependent variable and is statistically significant at the 0.1% level.

The findings from Equation 3 would read the same as the findings from Equation 1.

Table 11: OLS estimation of Parental Dissatisfaction Using a Binary Version Of the Polity Variable where if polity is positive the Value is 1 and if the value is negative then the value is 0- School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.12*** (0.02)	0.05** (0.02)	0.05** (0.02)
Dummy polity variable	-0.12*** (0.03)	-0.19*** (0.03)	-0.21*** (0.03)
Private	-0.17*** (0.03)	-0.20*** (0.02)	-0.16*** (0.02)
Teacher Professional Development	0.06 (0.04)	0.04 (0.03)	0.11** (0.03)
Teacher Certification	-0.00*** (0.00)	-0.00 (0.00)	-0.00 (0.00)
Average Mother's Education	-0.06*** (0.01)	0.02* (0.01)	-0.01 (0.01)
Average Teacher's Education Levels	0.03 (0.04)	0.04 (0.03)	0.12*** (0.03)
Constant	2.12*** (0.14)	1.83*** (0.10)	1.56*** (0.11)
Observations	886	886	886

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 11 the polity variable was changed to a binary variable where if the value of the polity score is under 0 then the value is 0 and if the polity score is above zero it is 1. The results of the equations run with the dummy polity variable in lieu of the polity variable are overall similar to the Table 10 results. This works as a robustness check for the polity variable and leads me to view the variable as robust.

For Table 12 through Table 16 the equation is being looked at on a country by country level. With each run of the equation being for just the one Country. This was done to gather further insight into the relation of the variables within each given country.

Table 12: OLS estimation of Parental Dissatisfaction in Italy-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.12** (0.04)	0.04 (0.04)	0.06 (0.04)
Private	-0.07 (0.07)	-0.24*** (0.06)	-0.20** (0.07)
Teacher Professional Development	-0.12 (0.06)	-0.07 (0.05)	-0.06 (0.05)
Teacher Certification	0.00 (0.00)	0.00 (0.00)	0.00* (0.00)
Average Mother's Education	-0.11*** (0.03)	-0.00 (0.02)	-0.05* (0.02)
Average Teacher's Education Levels	-0.07 (0.08)	0.06 (0.06)	0.02 (0.06)
Constant	2.51*** (0.26)	1.92*** (0.17)	2.00*** (0.22)
Observations	258	258	258

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 12 equation 1 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 1% level. Private moves in the opposite direction as the dependent variable and is not statistically significant. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

For Table 12 equation 2 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is not statistically significant. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

For Table 12 equation 3 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is statistically significant at the 5% level. Average mother's education moves in the opposite direction as the dependent variable and is not statistically significant. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

Table 13: OLS estimation of Parental Dissatisfaction in Korea-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.03 (0.06)	0.05 (0.03)	0.01 (0.04)
Private	-0.17*** (0.05)	-0.09** (0.03)	-0.09** (0.03)
Teacher Professional Development	-0.07 (0.14)	0.12 (0.08)	0.08 (0.08)
Teacher Certification	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Average Mother's Education	-0.34*** (0.05)	-0.10** (0.03)	-0.10** (0.04)
Average Teacher's Education Levels	0.00 (0.12)	-0.02 (0.07)	-0.02 (0.08)
Constant	3.89*** (0.47)	2.16*** (0.29)	2.43*** (0.31)
Observations	136	136	136

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 13 equation 1 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 0.1% level. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

For Table 13 equation 2 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher's education

levels moves in the opposite direction as the dependent variable and is not statistically significant.

For Table 13 equation 3 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

Table 14: OLS estimation of Parental Dissatisfaction in Macao-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.14* (0.06)	0.00 (0.06)	0.08 (0.07)
Private	-0.15 (0.08)	-0.15 (0.08)	-0.16 (0.11)
Teacher Professional Development	-0.20 (0.23)	0.01 (0.16)	0.17 (0.26)
Teacher Certification	-0.00** (0.00)	0.00 (0.00)	0.00 (0.00)
Average Mother's Education	-0.09*** (0.02)	-0.03 (0.02)	-0.01 (0.02)
Average Teacher's Education Levels	0.07 (0.15)	-0.09 (0.11)	0.01 (0.17)

Constant	2.27*** (0.62)	2.51*** (0.49)	1.73* (0.67)
Observations	45	45	45

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 14 equation 1 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is statistically significant at the 5% level. Private moves in the opposite direction as the dependent variable and is not statistically significant. Teacher professional development moves in the opposite direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is statistically significant at 1% level. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

For Table 14 equation 2 the results are as follows: decentralization of decision-making at school moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is not statistically significant. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent

variable and is not statistically significant. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

For Table 14 equation 3 the results are as follows: decentralization of decision-making at School moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is not statistically significant. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is not statistically significant. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

Table 15: OLS estimation of Parental Dissatisfaction in Portugal-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	0.00 (0.04)	-0.01 (0.03)	-0.02 (0.03)
Private	-0.35*** (0.07)	-0.43*** (0.06)	-0.39*** (0.07)
Teacher Professional Development	0.17 (0.11)	0.16 (0.10)	0.14 (0.10)
Teacher Certification	-0.00* (0.00)	-0.00 (0.00)	0.00 (0.00)
Average Mother's Education	-0.10*** (0.02)	0.01 (0.02)	0.01 (0.01)
Average Teacher's Education Levels	-0.07 (0.07)	0.05 (0.07)	0.05 (0.06)

Constant	2.64*** (0.32)	1.80*** (0.30)	1.85*** (0.28)
Observations	142	142	142

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 15 equation 1 the results are as follows: decentralization of decision-making at School moves in the same direction as the dependent variable and is statistically significant at the 5% level. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is statistically significant at 5% level. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

For Table 15 equation 2 the results are as follows: decentralization of decision-making at School moves in the opposite direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the opposite direction as the dependent variable and is not statistically significant. Average Mother's Education moves in the same direction as the

dependent variable and is not statistically significant. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

For table 15 equation 3 the results are as follows: decentralization of decision-making at School moves in the opposite direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the same direction as the dependent variable and is not statistically significant. Teacher's education levels moves in the same direction as the dependent variable and is not statistically significant.

Table 16: OLS estimation of Parental Dissatisfaction in Spain-School level

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at School	-0.04 (0.06)	0.04 (0.05)	0.01 (0.05)
Private	-0.13* (0.06)	-0.19*** (0.05)	-0.19*** (0.05)
Teacher Professional Development	0.05 (0.10)	0.08 (0.10)	0.12 (0.10)
Teacher Certification	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Average Mother's Education	-0.06* (0.02)	0.02 (0.02)	-0.01 (0.03)
Average Teacher's Education Levels	-0.09 (0.12)	-0.04 (0.11)	-0.03 (0.13)
Constant	2.77*** (0.47)	1.86*** (0.49)	2.01*** (0.56)

Observations	159	159	159

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

For Table 16 equation 1 the results are as follows: decentralization of decision-making at School moves in the opposite direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 5% level. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is statistically significant at the 5% level. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

For Table 16 equation 2 the results are as follows: decentralization of decision-making at School moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the same direction as the

dependent variable and is not statistically significant. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

For Table 16 equation 3 the results are as follows: decentralization of decision-making at School moves in the same direction as the dependent variable and is not statistically significant. Private moves in the opposite direction as the dependent variable and is statistically significant at the 1% level. Teacher professional development moves in the same direction as the dependent variable and is not statistically significant. Teacher certification moves in the same direction as the dependent variable and is not statistically significant. Average mother's education moves in the opposite direction as the dependent variable and is not statistically significant. Teacher's education levels moves in the opposite direction as the dependent variable and is not statistically significant.

7.3. Contextual Results of School Level

Through the school level results the dissonance that is seen in the parent level equations is holding constant. We continue to see parents seeming to be more dissatisfied with schools that have more decentralized decision-making structures even through individuals that live in countries that are more decentralized at the national level are less dissatisfied with the education their child receives.

8. Robustness Tests

Tables 17 through 21 were created as robustness tests to the results.

Table 17: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction for Equation 1 - Standards of Achievement are high in their child's school

	1	2	3	4
Decentralization of Decision-making at school	0.25* (0.11)	0.07 (0.05)	0.07 (0.05)	
Polity	0.06 (0.04)	-0.02* (0.01)		-0.03* (0.01)
Interaction between Decentralization and polity		-0.02* (0.01)		
Private	-0.34*** (0.05)	-0.34*** (0.05)	-0.33*** (0.05)	-0.30*** (0.05)
Teacher Certification	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)	-0.00** (0.00)
Teacher Education level 2	0.03 (0.10)	0.03 (0.10)	0.03 (0.10)	0.03 (0.10)
Teacher Education level 3	-0.03 (0.08)	-0.03 (0.08)	-0.03 (0.08)	-0.03 (0.08)
Teacher Education level 4	-0.04 (0.08)	-0.04 (0.08)	-0.05 (0.08)	-0.05 (0.08)
Teacher Education level 5	0.05 (0.09)	0.05 (0.09)	0.05 (0.09)	0.05 (0.09)
Teachers years of Professional development	0.01 (0.08)	0.02 (0.08)	0.01 (0.08)	0.02 (0.08)
Mother's education level 1	-0.14** (0.05)	-0.14** (0.05)	-0.14** (0.05)	-0.14** (0.05)
Mother's education level 2	-0.16*** (0.05)	-0.16*** (0.05)	-0.16*** (0.05)	-0.16*** (0.05)
Mother's education level 3	-0.09 (0.05)	-0.09 (0.05)	-0.09 (0.05)	-0.09 (0.05)

Mother's education level 4	-0.14**	-0.14**	-0.14**	-0.14**
	(0.05)	(0.05)	(0.05)	(0.05)
Mother's education level 5	-0.14**	-0.14**	-0.14**	-0.14**
	(0.05)	(0.05)	(0.05)	(0.05)
Mother's education level 6	-0.13**	-0.13**	-0.13**	-0.13**
	(0.05)	(0.05)	(0.05)	(0.05)
cut1				
Constant	-0.93*	-1.63***	-1.47***	-1.81***
	(0.42)	(0.23)	(0.22)	(0.20)
cut2				
Constant	0.97*	0.27	0.43	0.08
	(0.42)	(0.23)	(0.22)	(0.20)
cut3				
Constant	2.31***	1.61***	1.77***	1.42***
	(0.42)	(0.23)	(0.22)	(0.20)
Observations	23826	23826	23826	23826

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 18: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction for Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated

	1	2	3	4
Decentralization of Decision-making at school	0.17*	0.03	0.03	
	(0.07)	(0.03)	(0.03)	
Polity	0.04	-0.02*		-0.02*
	(0.03)	(0.01)		(0.01)
Interaction between Decentralization and polity		-0.02*		
		(0.01)		
Private	-0.30***	-0.30***	-0.30***	-0.29***
	(0.04)	(0.04)	(0.04)	(0.03)
Teacher Certification	0.00*	0.00*	0.00*	0.00*

	(0.00)	(0.00)	(0.00)	(0.00)
Teacher Education level 2	0.06 (0.10)	0.06 (0.10)	0.06 (0.10)	0.06 (0.10)
Teacher Education level 3	0.07 (0.08)	0.07 (0.08)	0.07 (0.08)	0.07 (0.08)
Teacher Education level 4	0.10 (0.08)	0.10 (0.08)	0.10 (0.08)	0.10 (0.08)
Teacher Education level 5	0.07 (0.09)	0.07 (0.09)	0.07 (0.09)	0.06 (0.09)
Teachers years of Professional development	0.07 (0.06)	0.08 (0.06)	0.07 (0.06)	0.08 (0.06)
Mother's education level 1	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)
Mother's education level 2	-0.05 (0.05)	-0.05 (0.05)	-0.05 (0.05)	-0.05 (0.05)
Mother's education level 3	0.01 (0.05)	0.01 (0.05)	0.00 (0.05)	0.01 (0.05)
Mother's education level 4	0.01 (0.05)	0.01 (0.05)	0.00 (0.05)	0.01 (0.05)
Mother's education level 5	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)
Mother's education level 6	-0.01 (0.05)	-0.01 (0.05)	-0.01 (0.05)	-0.01 (0.05)
cut1				
Constant	-0.35 (0.31)	-0.89*** (0.19)	-0.74*** (0.18)	-0.97*** (0.17)
cut2				
Constant	1.73*** (0.31)	1.18*** (0.19)	1.34*** (0.18)	1.11*** (0.17)
cut3				
Constant	2.56*** (0.31)	2.02*** (0.19)	2.18*** (0.19)	1.95*** (0.17)
Observations	23896	23896	23896	23896

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 19: Ordered Probit Multilevel Model estimation of Parental Dissatisfaction for Equation 3 - Their Child's School does a good job in educating students

	1	2	3	4
Decentralization of Decision-making at school	0.171 (0.0890)	-0.0000288 (0.0399)	0.000878 (0.0400)	
Polity	0.0408 (0.0358)	-0.0323** (0.0107)		-0.0323** (0.0106)
Interaction between Decentralization and polity		-0.0195* (0.00907)		
Private	-0.334*** (0.0451)	-0.333*** (0.0453)	-0.330*** (0.0455)	-0.333*** (0.0396)
Teacher Certification	0.000620 (0.000338)	0.000660 (0.000339)	0.000740* (0.000339)	0.000660 (0.000339)
Teacher Education level 2	-0.153 (0.103)	-0.152 (0.103)	-0.153 (0.103)	-0.152 (0.103)
Teacher Education level 3	-0.0986 (0.0827)	-0.0983 (0.0827)	-0.0999 (0.0827)	-0.0983 (0.0827)
Teacher Education level 4	-0.0700 (0.0855)	-0.0705 (0.0856)	-0.0732 (0.0856)	-0.0705 (0.0855)
Teacher Education level 5	-0.0522 (0.0920)	-0.0521 (0.0920)	-0.0533 (0.0920)	-0.0521 (0.0920)
Teachers years of Professional development	0.172* (0.0713)	0.182* (0.0715)	0.170* (0.0713)	0.182* (0.0714)
Mother's education level 1	-0.0410 (0.0521)	-0.0412 (0.0521)	-0.0409 (0.0521)	-0.0412 (0.0521)
Mother's education level 2	-0.0297 (0.0479)	-0.0296 (0.0479)	-0.0302 (0.0480)	-0.0296 (0.0479)

Mother's education level 3	0.0132 (0.0542)	0.0124 (0.0542)	0.0105 (0.0542)	0.0124 (0.0542)
Mother's education level 4	0.0341 (0.0482)	0.0331 (0.0482)	0.0314 (0.0482)	0.0331 (0.0482)
Mother's education level 5	0.0162 (0.0510)	0.0152 (0.0510)	0.0122 (0.0510)	0.0152 (0.0510)
Mother's education level 6	0.0697 (0.0495)	0.0669 (0.0495)	0.0650 (0.0495)	0.0669 (0.0495)
cut1				
Constant	-0.544 (0.369)	-1.182*** (0.217)	-0.967*** (0.215)	-1.182*** (0.186)
cut2				
Constant	1.621*** (0.369)	0.983*** (0.217)	1.198*** (0.215)	0.983*** (0.186)
cut3				
Constant	2.561*** (0.369)	1.923*** (0.218)	2.138*** (0.216)	1.923*** (0.187)
Observations	23851	23851	23851	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 17, Table 18, and Table 19 show ordered probit multilevel models for the three dependent variables which are the multilevel model robustness tests for Table 4, Table 5, and Table 6.

Table 17 as the multilevel ordered probit version of Table 4's ordered probit tells a very similar story. The direction on the coefficients for decentralized decision-making and polity are similar to those in Table 4, they just have less—if any—significance. This

suggests that, when accounting for the fact that decentralization is measured at the school-level and parental satisfaction at the parent level, the strength of influence is muted.

Table 18 as the multilevel ordered probit version of Table 5's ordered probit tells a very similar story. Again, the direction on the coefficients for decentralized decision-making and polity are similar to those in in Table 5, they just have weaker—if any—significance.

Table 19 as the multilevel ordered probit version of Table 6's ordered probit tells a very similar story. Again, the direction on the coefficients for decentralized decision-making and polity are similar to those in in Table 6, they just have weaker—if any—significance. In all, Tables 17 – 19 provide evidentiary support for the results found in Tables 4 – 6.

Table 20: Ordered Probit with a binary OECD variable instead of polity

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at school	0.143***	0.110***	0.0832***
	(0.0188)	(0.0195)	(0.0195)
OECD	-0.280***	-0.314***	-0.436***
	(0.0281)	(0.0291)	(0.0292)
Private	-0.307***	-0.320***	-0.272***
	(0.0213)	(0.0222)	(0.0222)
Teacher Certification	-0.00120***	0.0000203	0.000188
	(0.000137)	(0.000142)	(0.000142)
Teacher Education	-0.0670	0.0171	-0.103

level 2	(0.0920)	(0.0958)	(0.0961)
Teacher Education level 3	-0.0665 (0.0733)	0.0735 (0.0765)	0.0175 (0.0764)
Teacher Education level 4	0.0150 (0.0748)	0.155* (0.0781)	0.141 (0.0779)
Teacher Education level 5	-0.0758 (0.0815)	0.0101 (0.0850)	0.00922 (0.0849)
Teachers years of Professional development	0.0972** (0.0370)	0.0869* (0.0383)	0.292*** (0.0386)
Mother's education level 1	-0.122* (0.0482)	-0.0146 (0.0500)	-0.0518 (0.0502)
Mother's education level 2	-0.119** (0.0439)	0.00386 (0.0456)	-0.0101 (0.0458)
Mother's education level 3	-0.0668 (0.0493)	0.0927 (0.0513)	0.0523 (0.0515)
Mother's education level 4	-0.120** (0.0434)	0.112* (0.0451)	0.0782 (0.0453)
Mother's education level 5	-0.0916* (0.0456)	0.116* (0.0474)	0.130** (0.0475)
Mother's education level 6	-0.239*** (0.0442)	0.0230 (0.0460)	0.0270 (0.0461)
cut1 Constant	-1.251*** (0.118)	-0.708*** (0.123)	-0.653*** (0.123)
cut2 Constant	0.496*** (0.118)	1.295*** (0.123)	1.392*** (0.123)
cut3 Constant	1.740*** (0.119)	2.116*** (0.124)	2.298*** (0.125)
Observations	23826	23896	23851

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school

Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 20, structured as Table 10 was, looks at the three dependent variables and runs the equations as an ordered probit; however, instead of including polity, the equations in Table 20 using a binary variable for OECD status. This data was sourced from the PISA data. The coefficient on the OECD dummy is negative and statistically significant at the 0.1% level. This suggests that, in previous tables, polity may have served as a proxy for the income levels of countries instead of the national decision-making structure.

Table 21: Ordered Probit estimation of Parental Dissatisfaction with Fixed Effects

	Equation#1	Equation#2	Equation#3
Decentralization of Decision-making at school	0.05**	0.02	0.00
	(0.02)	(0.02)	(0.02)
Private	-0.29***	-0.27***	-0.29***
	(0.02)	(0.02)	(0.02)
Teacher Certification	-0.00***	0.00**	0.00**
	(0.00)	(0.00)	(0.00)
Teacher Education level 2	-0.09	0.04	-0.17
	(0.09)	(0.10)	(0.10)
Teacher Education level 3	-0.15*	0.06	-0.11
	(0.07)	(0.08)	(0.08)
Teacher Education level 4	-0.16*	0.08	-0.10
	(0.08)	(0.08)	(0.08)
Teacher Education level 5	-0.11	0.05	-0.08
	(0.08)	(0.09)	(0.09)
Teachers years of	0.02	0.06	0.17***

Professional development	(0.04)	(0.04)	(0.04)
Mother's education level 1	-0.15**	-0.04	-0.07
	(0.05)	(0.05)	(0.05)
Mother's education level 2	-0.16***	-0.05	-0.03
	(0.04)	(0.05)	(0.05)
Mother's education level 3	-0.15**	0.01	-0.01
	(0.05)	(0.05)	(0.05)
Mother's education level 4	-0.21***	0.01	0.02
	(0.04)	(0.05)	(0.05)
Mother's education level 5	-0.25***	-0.04	-0.01
	(0.05)	(0.05)	(0.05)
Mother's education level 6	-0.27***	-0.02	0.03
	(0.04)	(0.05)	(0.05)
Chile	-0.09**	-0.03	-0.07*
	(0.03)	(0.03)	(0.03)
Italy	-0.16***	0.02	-0.26***
	(0.03)	(0.03)	(0.03)
Korea	0.23***	0.25***	0.23***
	(0.03)	(0.03)	(0.03)
Macao	0.24***	0.33***	0.41***
	(0.03)	(0.04)	(0.04)
Portugal	-0.26***	-0.19***	-0.23***
	(0.03)	(0.03)	(0.03)
cut1			
Constant	-1.53***	-0.68***	-0.91***
	(0.12)	(0.13)	(0.13)
cut2			
Constant	0.23	1.33***	1.15***
	(0.12)	(0.13)	(0.13)
cut3			
Constant	1.48***	2.15***	2.06***
	(0.12)	(0.13)	(0.13)
Observations	23826	23896	23851

Standard errors in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Equation 1 - Standards of Achievement are high in their child's school
Equation 2 - Most of their Child's School Teachers Seem Competent and Dedicated
Equation 3 - Their Child's School does a good job in educating students

Table 21 relays information regarding the three dependent variables with country level fixed effects. From the ordered probit it can be observed that the results are exceptionally similar to prior tables in the paper. With the individual countries directionality, in relation to the dependent variable, and significance switching between countries. This could be showing a trend that was brought up in the literature review, one where different people are satisfied by different things and the same initiative will not necessarily work everywhere.

9. Conclusion

From the baseline regression equation, using the equation 1 variables, overall the dependent variable in question moves in opposition to the decentralization of decision making at schools which means that parents rate themselves as more dissatisfied when in a more decentralized school but this is seen in countries that are more centralized at the government level. This dissonance between the relation of decentralized decision making at school level and the dependent variable vs polity and the dependent variable is what is held through the varied runs of the equation. From these results we can conclude that parents seemed to be more dissatisfied with schools that have more decentralized decision-making structures. This being true even though individuals that live in countries that are more decentralized at the national level (i.e. democracies) are less dissatisfied with the education their child receives. This might reflect the fact that individuals in

democracies may have greater opportunities to select the school their child attends. This observation could also stem from a confirmation bias of the parent. If the parent has more say in where the child goes to school and can leverage their choice to maximize their satisfaction they could be more likely to rate the school higher than they would otherwise because they had a hand in choosing the school.

From the OLS the trend was inverted but still held where the different versions of the equation was that decentralization of decision - making at schools was often found to be moving in the same direction as the dependent variables estimating parental dissatisfaction. The trend for polity were it was found to be moving in the opposite direction to the dependent variables estimating parental dissatisfaction. When subbing in and out different equation variables there were slight differences in direction of influence and what was found to be significant. These differences were especially evident in the equations featuring solitary country's data.

The next steps I would like to take for this would be to look at the polity scores of countries that share a border with the countries mentioned and see how their neighbors could potentially affect the dependent variables estimating parental dissatisfaction. Through this addition I hope to shed more light on why polity scores had the response they ended up having from the equations.

10. Appendixes

Appendix 1- Description of variables source, level, original variable name, with a general description of each one.

Variable	Data Source	PISA Survey	Variable Name (CodeBook)	Data Description
Mother's Education	PISA 2015	Student	MISCED	Mother's Education (ISCED)
Professional Development	PISA 2015	School	SC025Q01NA	Teaching staff in your school has attended a programme of professional development? All teaching staff
Public/Private	PISA 2015	School	SC013Q01TA	Is your school a public or a private school?
Teacher Certification	PISA 2015	School	SC018Q02TA01	Teachers <fully certified> by <the appropriate authority>: Full-time
Decentralization of Decision-making at School	PISA 2015	School	INDEX	
Teacher's Education Levels	PISA 2015	Teacher	TC012Q01NA	Originally trained teacher (strict definition): standard teacher training
Polity	Center for Systematic Peace		Polity	

Appendix 2 – PISA variables used in the paper including the question from the survey that collected this data and a list of the possible values of the different variables.

Equation Variable	Control Variable Question	Value	Label
Public School	Is your school a public or a private school?	1	Public School
		2	Private Schol
Mother's education	Mother's Education (ISCED)	0	None
		1	ISCED 1
		2	ISCED 2
		3	ISCED 3B, C
		4	ISCED 3A, ISCED 4
		5	ISCED 5B
		6	ISCED 5A, 6
Teacher Professional Development	Are you required to take part in professional development activities	1	Yes
		2	No
Teacher Certification	Teachers <fully certified> by <the appropriate authority>: Full-time	0-670	
Teacher's Education Levels	What is the highest level of formal education you have completed	1	<Below ISCED Level 5>
		2	<ISCED Level 5B>
		3	<ISCED Level 5A Bachelor degree>
		4	<ISCED Level 5A Masters degree>
		5	<ISCED Level 6>

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