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Thread of Influence: Understanding the Dynamics Shaping Current Academic Performance in Faisalabad's Matriculation Students through Sibship, Prior Academic Performance, and Parental Involvement

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Abstract: *The study assessed the impact of sibship size, prior academic performance, and parental involvement on the current academic performance of matriculation students in urban schools in Faisalabad. A multistage sampling technique was used to select respondents. The study used a quantitative and cross-sectional research design. The questionnaire had items related to the study variables. The questionnaire was pretested on 30 students to assess its validity and reliability. The findings of the study revealed that prior academic performance and parental involvement significantly positively impact current academic performance. However, the study underscores the robust negative impact of sibship size on current academic performance. These findings offer significant new information for the field of educational assessment and evaluation. The study helps to focus student interventions and promote a comprehensive comprehension of the various factors that influence the current academic performance of high school students.*

Key Words: Sibship Size, Prior Academic Performance, Parental Involvement, Current Academic Performance, High School Students

Introduction

High school students' academic success is extremely important because it is a major factor in determining future educational and employment options. An individual's career path is shaped by their high school education, as entrance to prominent institutions and vocational programmes is frequently contingent upon a strong academic foundation (Poon, 2020). Furthermore, scholastic achievement and personal growth are closely related, as they both promote critical thinking, problem-solving, and effective communication (Kriegbaum, Jansen, Spinath, & differences, 2015; McMillan, Rothman, Buckley, & Edwards, 2021). High school performance is another important indicator for assessing how well educational systems and policies are working, as it can reveal areas that need to be improved to guarantee that all students have equal access to high-quality education (Nitowski, 2023; Park, 2008). Beyond the effects on the individual and the system, high school students' academic accomplishments have a major impact on society's total intellectual capital, influencing innovation, leadership, and societal advancement in the future (Tan, Lyu, & Peng, 2020).

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There are significant and compelling research implications for people, educational institutions, and society at large from the study of factors influencing academic achievement. Academic achievement is essential to both individual and societal advancement; it is not just a personal achievement. It is not only intellectually interesting but also contains the key to unlocking successful ways for educational progress to untangle the complex web of factors including sibling size, prior academic performance, and parental involvement (Lemessa, Senbeto, Alemayehu, & Gemechu, 2023; Yousafzai et al., 2024; Mbaluka, Brand, & Henry Saturne, 2021; Núñez, Rodriguez, Tuero, Fernandez, & Cerezo, 2022; Poon, 2020).

Understanding the combined effects of sibling size, prior academic performance, and parental involvement on the current academic performance of high school students in Pakistan remains a significant research gap despite the growing body of research examining the factors influencing academic performance. Studies that have already been done tend to concentrate on individual components alone, ignoring the complex combined effect these variables have in Pakistan's unique cultural and social environment. A thorough analysis of how higher family sizes, differing degrees of parental involvement, and a range of academic backgrounds influence Pakistani high school student's academic performance has received little attention. To create focused interventions and policies that address the difficulties experienced by students in Pakistan's educational system, it is imperative that this gap be closed. Thus, the proposed study aims to evaluate the impacts of Sibship size, prior academic performance, and parental involvement on the current academic performance of high school students of urban schools in Faisalabad, Punjab, Pakistan.

This study makes several contributions to the existing literature on familial and prior performance-related factors impacting the academic performance of high school students. First, Pakistan offers a special background for comprehending the effects on academic performance because of its own social and cultural dynamics. Examining the proposed variables within the framework of Pakistan offers culturally appropriate knowledge that can guide educational activities and policies that are adapted to the unique requirements of the students. Second, bigger families could have trouble allocating resources like parental time and attention. By examining the effects of Sibship size, the proposed study can help families allocate resources strategically, assisting educators and policymakers in creating support networks to help students from larger families with any difficulties they may encounter. Third, comprehending the combined impact that sibship size, prior academic performance, and parental involvement have on current academic performance can offer significant advantages for formulating focused and knowledgeable educational interventions. The study can help stakeholders, educators, and policymakers create successful student support plans. Finally**,** high school students may benefit from targeted support programs. Identifying the factors that contribute to academic success - like parental involvement and prior academic performance - can inform the design of programs that address the unique challenges faced by students in the educational landscape.

Literature Review

Scholarly research has extensively examined the effects of sibship size, prior academic performance, and parental involvement on students' academic outcomes (Aguirre-Dávila et al., 2023; Barksdale, Peters, & Corrales, 2021; Berkowitz et al., 2021; Bester & Kuyper, 2020; Blaabæk, Jæger, & Molitoris, 2020). Prior studies have frequently examined these elements separately, offering insightful information on each of their effects. Studies by C. Chen, Terrizzi, Chou, and Lien (2020) and Choi, Taiji, Chen, and Monden (2020), for example, have shown a substantial link between lower academic attainment and larger sibling sizes. In a similar vein, studies by Berkowitz et al. (2021) and Panaoura (2021) have consistently highlighted the favourable relationship between improved academic achievement and parental involvement.

A thick body of research reflects the complex web of factors impacting students' educational results (Rodríguez et al., 2019; Senar, Eryilmaz, Sandoval-Hernández, & Lapresta-Rey (2018); Shen, 2023; Sun & Li, 2009). Research investigating how the size of a sibling group affects academic achievement has produced a range of results. For example, Yang (2019) found a negative relationship between academic achievement and sibling size, indicating that higher competition for resources within the family could lead to worse educational outcomes. Tanskanen, Erola, and Kallio (2016), on the other hand, discovered conflicting data, highlighting the necessity of careful analyses taking contextual factors into account.

Additionally, previous academic achievement is a reliable indicator of future success (McMillan et al., 2021; Shen, 2023). High achievers tend to maintain their success in school, demonstrating the lasting impact of prior successes on future learning results (Nitowski, 2023). Research has also been done on the connection between past academic success and present academic progress in university (Alameri, Masadeh, Hamadallah, Ismail, & Fakhouri, 2020; Alla, 2019). For example, strong correlations have been observed between grades in a single university subject and secondary school performance. Furthermore, a correlation was observed between the number of university exams passed and secondary school grades. There have been suggestions that the secondary school GPA's predictive ability stems from the variety of topics it assesses and the evaluation of the teachers involved. Nonetheless, research has also been done on each subject's ability to predict outcomes (Kim & Society, 2020). The most significant predictor of study credits in a study on scientific students' achievement was found to be their secondary school math grade. The results of the Matriculation Examination indicate the general and advanced academic standing of medical students but not their studies. Conversely, students' scores on the Matriculation Examination in the humanities and social sciences did not indicate their course of study (Korpershoek, Canrinus, Fokkens-Bruinsma, & de Boer, 2020).

Furthermore, in educational research, parental participation has received a lot of attention because it is known to be a significant predictor of academic performance (Grijalva-Quiñonez, Valdés-Cuervo, Parra-Pérez, & Vazquez, 2020; Ibrahim, Musthafa, & Marikar, 2021; Kim & Society, 2020; Mbaluka et al., 2021). The significant role that families play in creating a nurturing learning environment is highlighted by the favourable link that has been found between parental engagement and academic performance. Studies, however, have primarily looked at parental participation in isolation, ignoring the possibility that it combines with sibling size and prior academic achievement (Tan et al., 2020).

Notwithstanding these insightful observations, there is a noticeable gap in the literature when it comes to the simultaneous evaluation of sibship size, prior academic achievement, and parental involvement in influencing academic performance. Rodríguez et al. (2019) and Sun and Li (2009) have put forth theoretical frameworks that highlight the interdependence of these elements and call for a comprehensive method of researching academic accomplishment. To close this knowledge gap, the proposed study aims to provide a thorough grasp of how sibling size, prior performance, and parental involvement affect high school students' academic performance. By combining these factors, the study hopes to offer insights that can guide focused interventions that address the intricate relationship between familial and academic factors that impact the academic achievement of high school students.

Material and Methods

The population of the present study was all 9th-grade students of public sector schools in Faisalabad district. The target population was the 9th-grade male students of all public-sector schools in Tehsil City, Faisalabad. Multistage sampling was used in the present study. Faisalabad district is composed of six tehsils. In the first stage, one tehsil was selected through simple random sampling. This tehsil had forty male schools. A list of schools was obtained from the office of the District Education Officer (DEO) in Faisalabad. In the second stage, ten schools were selected randomly from the selected tehsil. Finally, students were selected through simple random sampling from each class. Students were selected through proportionate sampling. Students were selected from each class. To obtain a representative sample of students, 450 questionnaires were issued. Three hundred thirty surveys were completed. Thirty questionnaires had multiple missing values and were incomplete. As a result, these surveys received no consideration. In the end, 300 surveys were determined to be accurate and comprehensive.

The questionnaire had two sections. The first section contains sociodemographic variables. They were the education level of the father and mother, household income, and Sibship size. The second section measured parental involvement, prior performance, and current performance. The study opted for the parental involvement attitudinal scale developed by Prater, Bermudez, and Owens (1997). This has eleven items. Some items were modified for regional relevance and cultural context. Four items were removed because they were not compatible with Pakistani culture, and their loading values were not statistically satisfactory because they were below the conventionally acceptable cut-off value of 0.7. Prior academic achievement was gauged through 8th-grade result reports issued by the Board of Intermediate and Secondary Education, Faisalabad (BISE, Faisalabad) to respondents.

It is pertinent hereto mention that for this study, student academic performance was defined as students' marks in board examinations, as they are the most frequently used gauge of students' school success and most likely to be impacted by the dynamics of students' immediate academic contexts. The dependent variable is a standardized composite score of a student's academic performance in a 9th-grade exam. It is conducted by the BISE (Board of Intermediate and Secondary Education) in Faisalabad every year. It is an interval-level variable. The score of this exam ranges from 0 to 550. Academic achievement, educational outcomes, academic attainment, educational attainment, academic score, and academic marks were used interchangeably in the present research. The meaning of these terms is the academic marks of students in the 9th-grade board exam.

We used a cross-sectional survey to assess the study's hypotheses. The study used multiple regression analysis and the correlation analysis technique using SPSS (Version 27.0; IBM Corp; 2022). In the social sciences, multiple regression and correlation analysis are recognised statistical methods for estimating the correlation between complex variables. The study variables, including Sibship size, parental involvement, prior academic performance, and current academic performance, were compared using correlation analysis. After controlling for other pertinent variables, multiple regression analysis was used to determine the degree to which Sibship size, parental involvement, and prior academic performance predicted current academic performance. Additionally, multiple regression analysis was carried out only after the normality of the dependent variable was established. A preliminary examination of the dependent variable's skewness and kurtosis values (skewness < 3.0; kurtosis < 10.0) suggested that it was getting closer to normalcy. More precisely, the White (1980) test statistic was used to assess the homoscedasticity of the residuals generated as the null hypothesis. Bivariate correlations and variance inflation factors (VIF) were examined to verify that collinearity was not an issue in the current study; the highest VIF was found to be well below the conventional cut limit.

Result and Discussions

The distribution of participants according to their parents' educational attainment is shown in Table 1. It is noteworthy that 36.7% and 34.3% of mothers and fathers, respectively, have completed secondary education. Understanding the parents of the participants' educational background can be gleaned from the distribution across educational categories. The majority of participants have incomes between 10,000 and 49,000, and families with three to five siblings are the most typical. An overview of the participants' family and economic backgrounds is given by the distribution. In conclusion, the table provides a thorough summary of the study participants' demographic details, emphasizing trends in family size, household income, and parental education.

Descriptive statistics are shown in the table for several family and academic variables, such as sibling size (SS), parental involvement (PI), prior performance (PP), and current performance (CP). The Sibship Size variable has an average value of roughly 4.51 with a range of 1 to 12. Data variability is moderate, according to the standard deviation. The Prior Performance variable has a mean of 478.84 and a range of 300 to 704. The standard deviation indicates that the range around the mean is rather small. The Parental Involvement variable has an average of 23.19 and a range of 7.00 to 42.00. A significant degree of heterogeneity in parental participation is shown by the standard deviation. The Current Performance variable has a mean of 331.00 with a range of 142 to 512. The standard deviation suggests a moderate level of variability in current performance.

Table 1

Sociodemographic characteristics of the study participants (n = 300)

Variables	Frequency	Percentage
Mother Education		
Illiterate (No Schooling)	64	21.3
Primary Level (I – V)	53	17.7
Secondary Level (VI – X)	110	36.7
Higher Level (College, University)	73	24.3

Father Education		
Illiterate (No Schooling)	54	18.0
Primary Level (I-V)	41	13.7
Secondary Level (VI-X)	103	34.3
Higher Level (College, University)	102	34.0
Monthly Household Income (PKR)		
< 10,000	64	21.3
10,000 – 49,999	139	46.3
50,000 – 89,999	85	28.3
≥ 90,000	12	4.0
Sibship size		
1-3 Siblings (Small)	162	54.0
4-7 Siblings (Medium)	103	34.3
More than 7Siblings (Large)	35	11.7

Table 2

Descriptive Statistics of the Study Variables

Vari-	Range-	Mean	Std. Devi-
SS	1 – 12	4.51	1.70
PP	300 – 704	478.84	79.00
PI	7 – 42	23.18	9.11
CP	142 – 512	331.00	74.12

Note: **SS**: Sibship size, **PP**: Prior performance, **PI**: Parental involvement, **CP**: Current performance

To sum up, Table 2 presents a succinct assessment of the central tendency and variability for every variable, revealing information about the study's family and academic components. Understanding the distribution and properties of the data for each variable is aided by the range, mean, and standard deviation.

Table 3

Correlational analysis among the study variables

VARI-	SS	PP	PI	CP
VARI-	SS	PP	PI	CP
SS	1	-.080*	-.051	-.082
PP		1	.279**	.568**
PI			1	.264**
CP				1

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

SS: Sibship size, **PP**: Prior performance, **PI:** Parental involvement, **CP**: Current performance

The Pearson correlation coefficients between the four variables—Sibship Size (SS), Parental Involvement (PI), Current Performance (CP), and Prior Performance (PP)—are displayed in Table 3. Sibship Size (SS), Parental Involvement (PI), and Current Performance (CP) exhibit weak negative connections with each other. This shows that weaker parental involvement and slightly inferior academic performance in the past and present are connected, however marginally, with bigger sibling sizes. Both Prior Performance (PP) and Parental Involvement (PI), as well as PP and Current Performance (CP), exhibit moderate to high positive associations. This suggests that greater parental involvement and higher present academic performance are linked to higher prior academic performance. Parental Involvement (PI) and Current Performance have a moderately positive association (CP). This suggests that improved current academic achievement is linked to higher levels of parental involvement.

To put it all up, the correlation matrix displays relationships between the variables under investigation. There is just a slight negative association between academic success and parental participation and larger sibling sizes. Both stronger parental involvement and higher present achievement are substantially connected with higher prior performance. Furthermore, there is a direct link between parental participation and current academic achievement. These revelations offer a sophisticated comprehension of the connections between the study's variables.

Hypotheses Testing

Hypothesis 1: *Sibship size significantly negatively impacts current academic performance*

Hypothesis 1 evaluates whether sibship size significantly negatively impacts current academic performance. The results reveal that Sibship size significantly negatively impacts current academic performance (B = -.134, t = -.709, p < .001). Hence Hypothesis_1 approved. The findings indicate that current academic performance tends to decline with the number of siblings. The intensity and significance of this association are indicated by the values (B = -.134, t = -.709, p <.001). Put more simply, having more siblings is linked to a statistically significant and detrimental effect on Students' current academic performance. Thus, the study lends credence to the notion that a student's academic achievement may be impacted by the size of their family.

Table 4

Multiple regression analysis

Hypotheses	Regression weights	B	t	p-value	Results
H_1	SS→CP	-.034	-.709	.000	Approved
H_2	PP→CP	.534	10.801	.000	Approved
H_3	PI→CP	.113	2.296	.000	Approved
R^2	.336				
Adjusted R^2	.324				
F (3, 223)	49.96				

Note: p < 0.001 **SS**: Sibship size, **PP**: Prior performance, **PI**: Parental involvement, **CP**: Current performance

A potential explanation of this finding is the allocation of family resources. The distribution and accessibility of family resources may be a factor in the reported drop in academic achievement that has been seen when the number of siblings increases. More children may share in the distribution of resources, including parental time, attention, and financial assistance in larger households. A student's capacity to concentrate on their academic obligations may be impacted by this allocation of resources, which may result in less individual support and supervision. A less favourable study environment may also be exacerbated by increased sibling rivalry for these scarce resources. This justification is consistent with the resource dilution theory (X. Chen, Huang, & Huang, 2023; Marjoribanks, 1991), which postulates that the number of resources available to a child decreases with each sibling, potentially impacting multiple areas of their development, including academic performance.

Several reports have shown that sibship size significantly negatively impacts current academic performance (Choi et al., 2020; Diaz, Fiel, & Review, 2020; Kreidl & Hubatkova, 2014; Vu & Tran, 2021). Similarly, as mentioned in the literature review, the number of siblings students have can impact their academic performance (Liu, Jiang, & Chen, 2020). In the same vein, prior studies have noted the importance of family size dynamics in affecting academic performance (Park, 2008; Tanskanen et al., 2016). Moreover, a strong relationship between family size and academic performance has been reported in the literature (Blaabæk et al., 2020; Franson, 2021; Ion, Lupu, & Nicolae, 2022; Lemessa et al., 2023). This study also confirms that the size of the family has the potential to impact students' current academic performance.

Hypothesis 2: Prior academic performance significantly positively impacts current academic performance

Hypothesis 2 evaluates whether prior academic performance significantly positively impacts current academic performance. The results reveal that prior academic performance significantly positively

impacts current academic performance (B = *.534*, t = *10.801*, p < .001). Hence Hypothesis_2 approved. According to the results, there is a significant and positive correlation between past and current academic performance. Based on the values (B =.534, t = 10.801, p <.001), there is evidence of a considerable and statistically significant association. Simply put, the likelihood that students will succeed in their present academic pursuits is high if they have a strong intellectual background. Thus, the research lends legitimacy to the notion that prior academic performance can serve as a reliable indicator of current academic achievement. One plausible argument that supports this finding is academic continuity and the idea of cumulative advantage, where past success builds a foundation for ongoing achievement.

This finding was also reported by Cheng, Armatas, and Wang (2020). Further, this finding is consistent with that of Kleemola, Hyytinen, and Toom (2023), who found that prior academic performance positively impacts current academic performance. A comparison of the findings with those of other studies confirms that prior academic performance impacts current academic performance positively (Nitowski, 2023). Likewise, this finding also accords with our earlier observations, which showed a positive association between prior academic performance and current academic performance (McMillan et al., McMillan2021). This result reflects those of Kleemola and Hyytinen (2019), who also found positive links between past academic performance and current academic performance. This result corroborates the findings of a great deal of previous work in the field of academic assessment.

Hypothesis 3: Parental involvement significantly positively impacts current academic performance

Hypothesis 3 evaluates whether parental involvement significantly positively impacts current academic performance. The results reveal that parental involvement significantly positively impacts current academic performance (B = *.113*, t = *2.296*, p < .001). Hence Hypothesis_2 approved. The findings suggest that students tend to do better in their current academic performance when their parents are more active. Express, in simpler terms, better academic achievement is correlated with parents who are involved and supportive. This research adds credence to the notion that parental involvement in their children's education positively influences their academic progress.

A potential explanation for this finding is that parental involvement positively impacts academic performance by creating a supportive learning environment. Engaged parents provide support, encouragement, and a positive attitude towards learning, leading to effective study habits, increased motivation, and enhanced academic self-esteem. Parent-child communication creates accountability and shared commitment to success. This highlights the importance of a collaborative home and school environment for students' academic success.

This finding is in line with those of previous studies (Berkowitz et al., 2021; Boonk, Gijselaers, Ritzen, & Brand-Gruwel, 2022; Chung, Phillips, Jensen, & Lanier, 2020). This finding is in agreement with those obtained by Grijalva-Quiñonez et al. (2020). Similarly, this finding is in accord with recent studies indicating that Parental involvement positively impacts current academic performance (Berkowitz et al., 2021; Mbaluka et al., 2021; Panaoura, 2021). Additionally, this finding is also consistent with those of Smith and Jones (2015), who found that Parental involvement has a positive impact on current academic performance. In the same vein, this finding agrees with Cureton's (2020) findings, which showed positive connections between Parental involvement and current academic performance. This finding supports previous research into the academic assessment area, which links parental involvement with academic outcomes.

Recommendations

Several recommendations can be made to improve academic performance based on the study's findings. Firstly, given the detrimental effects of bigger sibling sizes on students' present academic performance, educational institutions ought to think about putting in place specialised support programmes for students from larger households. These programmes might provide more funding and support to help address issues brought on by increased sibling rivalry for family resources. Secondly, teachers should give early intervention tactics for students who are struggling top priority because research shows that these strategies have a large positive impact on current academic performance. Early recognition of issues and resolutions can avoid unfavourable academic outcomes and promote long-term success. Thirdly, schools

should actively support programmes that encourage and facilitate parental engagement, considering the favourable association that has been found between parental involvement and current academic performance. Workshops, instructional sessions, and online forums can help parents better grasp how important it is for them to support their children's academic endeavours. Fourthly, institutions may also think about introducing family counselling services to address the relationship between academic results and home dynamics. Programmes can assist families with larger sibling sizes in managing obstacles and fostering academic success. Finally, longitudinal monitoring mechanisms can enable timely interventions and personalized support.

Conclusion

To sum up, this study has shed light on the intricate relationships between sibling size, prior academic achievement, parental involvement, and current academic performance. The results highlight how important it is to take these variables into account in their entirety rather than just separately to evaluate students' educational trajectories. Significantly, bigger sibling sizes have been noted as a possible problem that could have a negative impact on current academic achievement. On the other hand, it has been shown that parental involvement and prior academic success are positively correlated with current academic success. These findings have ramifications for educational policies and practices, indicating the necessity for specialised interventions that deal with the difficulties brought on by family dynamics. Further studies are needed to assess the impact of these variables. A longitudinal study evaluating the long-term impacts of sibling size, prior academic performance, and parental involvement on academic outcomes could be a future study option for researchers in the education field.

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