

**School leadership, School Socioeconomic
Background, and Educational Achievements in the
Gulf Cooperation Council Countries**

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Abstract:

This paper analyses the impact that school leaders' characteristics and school leadership practices have on student achievements in the Gulf Cooperation Council (GCC) countries. Using data from the 2019 Trends in International Mathematics and Science Study (TIMSS) assessment, we employ different model specifications to assess whether there is a direct or indirect relationship between school leadership and educational achievements in 4th and 8th grade, also accounting for the socioeconomic background of the school, teachers, and students' attitudes. The results of our analysis indicate that school principals may influence achievements by emphasizing academic success and ensuring a proper level of school safety, in addition to reducing instances of bullying. Additionally, our findings demonstrate the importance of professional development for teachers.

Keywords: School Leadership, TIMSS, GCC, socioeconomic background, Achievement, Academic Success, bullying, sense of belonging.

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1.Introduction

School principals play a significant role in determining the school climate and environment. Their role as school managers is vital in determining how the school and the teachers' and students' working- and studying- environment is led. Moreover, while school principals do not directly affect the design of national educational policies, they can, to some extent, play a relevant part in the effectiveness of such educational policies, as their implementation may depend on the principals' views and ideas on how to lead their schools.

In practice, school principals can include many leadership actions in the school's strategy. Therefore, it is important to investigate how these actions may impact students' educational achievements. While it is arguable that pupils' performance depends on many different factors, school leadership may not be the main one. Nevertheless, the way in which principals manage their schools can impact several factors - such as school climate, teaching strategy and well-being of students and instructors – which can in turn affects educational achievements. Thus, an analysis of the influence of school leadership strategies on the attainments of pupils can offer important insights on possible changes and a successful way of implementing them in order to create a more effective leadership methodology for principals.

The literature about school principals focuses strongly on the extent to which they can influence student achievements; thus, we investigate the relationship between educational achievements in 4th and 8th grade and school leadership, adding different model specifications to investigate whether the impact is direct. To this aim, the paper compares the estimations of this effect in the Gulf Cooperation Council countries (GCC), which include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

The scope of this analysis is to investigate how school leadership policies and principals' characteristics differ among these neighbouring countries and how they influence the educational achievements of their students. In particular, we focus on their experience and formal education, and school-related policies such as

the emphasis on academic success, discipline, and professional development made available for teachers. Additionally, since this analysis uses data from the 2019 TIMSS assessment, we compare estimations between 4th and 8th grade students. To have a comprehensive picture of the impact of school leadership on achievements, the TIMSS framework allows to assess the extent to which the principals' years of experience, formal education, and school management strategies can impact educational achievements. While educational policies and the availability of resources are usually determined at national level, principals can impact educational achievements through strategies affecting the school environment.

2.Literature review

School principals, due to their role as school leaders, can manage schools with significant power and impact their environment and climate. In literature, the debate on the impact on principals focuses mainly on the difference between direct and indirect effects meaning whether they can implement policies that improve the performance of students or whether they can do so only by intervening on other aspects (such as, for instance, safety); the former effects are found to be generally small in magnitude (Witziers et al., 2003). The literature further shows how the leadership of principals can be distinguished into transformational and instructional: transformational leadership refers to the provision of a direction to the school in terms of implemented general school policies, crucially with the support of and in cooperation with teachers and other school personnel (Conley & Goldman,1994; Leithwood, 1994). On the other hand, instructional leadership refers to decisions made about educational curricula and instruction, which may also be more hierarchical (Marks & Printy, 2003; Stewart, 2006). Robinson et al. (2008) showed how instructional leadership can have a significantly higher impact on educational achievements than transformational leadership, even though the latter is considered to be more modern and cooperative.

Different practices and domains exist regarding the leadership styles of school principals (Hambrick Hitt & Tucker, 2016). A further major branch of the research on school principals focuses on the

impact they have on school climate and the school's general features, but not directly on achievements (Nettles & Herrington, 2007). On average students manage to obtain higher educational achievements, especially on standardized tests, in schools where the learning environment is more serene and well-being is higher (MacNeil et al. 2009); therefore, principals may effectively improve schools' achievements through interventions on school climate. In fact, the behavior of principals was shown to strongly correlate with achievements, well-being, and the general environment at school (Liebowitz et al., 2019). Effective school leadership is also important for ensuring inclusivity in education, and to providing adequate support for disadvantaged students (Murphy, 2018; Esposito et al., 2019; Stadnick et al., 2019).

The behavior of school principals is found to significantly impact educational achievements (Eberts & Stone, 1988). Principals influence achievements through leadership in developing teaching practices and coordination activities, together with setting goals for the school (Robinson et al., 2008; Cobb, 2015). Moreover, there is a strong link between the way in which a school operates and principal's leadership, which together with programs for teachers' professional development account for the school's successful strategy (Sanzo et al., 2011; Rostini et al., 2022). In this respect, digital skills related to the use of computers or the internet, whose importance has been increasing within the schools and in the outside world, can be developed through professional support between different people in school (such as principals and teachers, or among teachers) (Cortellazzo et al., 2019). Furthermore, managing communication between different actors within the school is a key quality in a successful school principal's strategy, together with a clear division of responsibilities between different school's authorities (Crum & Sherman, 2008; Terziu et al., 2016). It has been claimed that principals should maintain open channels for communication and take care of the relationships between different people within their schools, with emphasis on the management of human resources (Daniels et al.,

2019). Furthermore, it has been proven that conflict management by school principals has a beneficial impact on the school climate (Chandolia & Anastasiou, 2020). Additionally, principals with more years of training and higher education have more impact on achievements (Khan & Shaheen, 2016).

On the other hand, there is also evidence showing that student achievements are not influenced by leadership practices nor are significantly affected by school climate (Allen et al., 2010). While there is less evidence in this direction, it has been pointed out that almost all the studies on the impact of school leadership on achievements are observational (Liebowitz & Porter, 2019), thus it may be difficult to infer causal relationships on the topic. Yet, Anderson (2017) argues that principals should facilitate change in schools, as well as improve the performance and attitudes of teachers and the general organization of schools, especially as research shows that teachers have a significantly higher motivation and self-efficacy when they perceive their school environment as supportive (Reaves & Cozzens, 2018), which may additionally benefit their students. Conversely, school resources, which partially depend on the principals, significantly affects educational achievements (Greenwald et al., 1996). In general, while school leadership may not have a direct causal link with achievements, it is still important to intervene where it is ineffective in improving school's conditions.

In general, when principals are interviewed, the main factors shaping their leadership styles are personal values, professional learning experiences, accessibility for students and staff, inclusive school culture, and the occurrence of critical incidents (Sider et al., 2017). While the GCC countries exhibit specific features which distinguish them from other countries in developing areas when it comes to school leadership due to their political, economic, and cultural shared features (Bailey et al., 2021), there is a relative lack of evidence related to the features of school leadership in this area (Hammad et al., 2022). Thus, studies based on data from this region can be particularly important to design policy recommendations for

the improvement of educational achievements and school climate (Hammad et al., 2022; Hammad & Alazmi, 2022).

In particular, Bailey et al. (2021) found that school leadership in the Gulf region differs significantly from that of other countries mainly in terms of the philosophy behind ideal leadership, the requirements and rules for principal selection, the way to support school leaders, and the beliefs that school leaders hold about success in their profession. Nonetheless, recent evidence also shows that school leadership can impact the engagement of teachers and their self-efficacy at work (Alazmi & Al-Mahdy, 2022) and that school principals may impact teacher turnover and job satisfaction (Al-Mahdy & Alazmi, 2021), which are findings in line with evidence from other geographical areas. It is therefore crucial to further investigate the way school leadership affects school climate and educational performance in the Gulf area, especially considering the importance and relatively scarce research on the topic.

Countries of GCC have started participating in the main international student assessments in the 2000s (except for Kuwait, which also participated in TIMSS in 1995). However, it has been only since the 2011 edition of TIMSS when all GCC states have participated in each edition of the assessment for 4th and 8th grade students. Since the same year, all of them also participated in the Progress in International Reading Literacy Study (PIRLS) assessment (except Bahrain, which started in the 2016 edition). Moreover, Qatar, Saudi Arabia and the United Arab Emirates also take part in the Programme for International Student Assessment (PISA) assessment. Thus, after some editions of TIMSS it is possible to use the outcomes of this assessment in order to have a comprehensive picture of the situation of schools in the region and propose interventions to improve the most challenging situations, particularly when it comes to school leadership.

As noted previously, the region exhibits specific features compared to other areas in the world, including political, economic, and cultural, which makes the study of school leadership important

and necessary (Bailey et al., 2021). Due to the importance of school leadership on achievements and the general environment and climate of schools (Marks & Printy, 2003; Stewart, 2006; Robinson et al., 2008), it is therefore crucial to assess the features and effects of leadership in this area, where relatively few evidence have been gathered on this topic. Due to the relatively scarce evidence in this respect (as the studies are all very recent), this can contribute to a better understanding of how school leadership can be more effective in the Gulf countries, in which it exhibits different features in terms of leadership style (Bailey et al., 2021), and in which achievements tend to lag behind the international average.

3.Data and methodology

To evaluate the impact of school leadership on educational achievements, we employed ordinary least squares (OLS) regressions in four different specifications on the estimations of school- and student-related indicators gathered from the 2019 TIMSS assessment for 4th and 8th grade students (Mullis et al., 2020). The TIMSS assessment relies upon the test of skills on two different domains, namely mathematics and science, and since its first edition in 1995 it has been administered every four years to 4th- and 8th-graders. All the GCC countries took part in the assessment for at least three editions as of 2019 (Bahrain and Saudi Arabia since 2003, Kuwait since 1995, Oman and Qatar since 2007, and the United Arab Emirates since 2011). For 4th grade students, TIMSS surveys the competencies of students whose mean age is at least 9.5 years, while for 8th grade students, the mean age is 13.5 years. National samples of approximately 4000 students, selected from 150 to 200 schools, took part in the 2019 assessment.

The 2019 Trends in International Mathematics and Science Study (TIMSS) employed a robust sampling design to ensure the representativeness and accuracy of its findings. The sampling process began with the selection of countries and educational systems that wished to participate in the study. Within each participating country, a two-stage sampling approach was utilized. First, schools were randomly selected, considering factors such as the grade level and

type of institution. Then, within each selected school, one or more intact classes were chosen to represent the target population. The final sample comprised a diverse range of schools, students, and educational contexts, enabling comprehensive insights into the mathematical and scientific achievement of fourth and eighth-grade students worldwide. The rigorous sampling methodology employed in TIMSS 2019 ensures the reliability and generalizability of the study's results, allowing for meaningful international comparisons and informing educational policies and practices globally.

Due to the amount of data and variables, the regressions are presented only for Saudi Arabia, while the estimations for the other GCC countries are presented in the Appendix. In addition to the evaluation of student achievements, the TIMSS assessment includes questionnaires that are administered to students themselves, as well as teachers and school principals. For our analyses, we use indicators gathered from these questionnaires, in order to study how school leadership is correlated with different aspects of the school life, the details of which are described below (Table 1). For our analyses, we use principal-, and student-provided indicators. For principals, we consider the years of experience, the formal education (measured on the ISCED scale), the emphasis on academic success and the occurrence of disciplinary problems in school (both of which are operationalized on a three-level scale: the former's includes "Very high emphasis", "High emphasis", and "Medium emphasis"; while the latter's includes "Hardly any problems", "Minor problems", and "Moderate to severe problems"). The hours of professional development, as reported by teachers, are also included among the school-level indicators. Furthermore, we account for student-level indicators of instances of bullying and sense of school belonging (both of which are operationalized on a three-level scale). We include the measure of the affluence of the socioeconomic background of the school (as reported by school principals) as an additional control variable.

Table 1. Variables used in the analyses.

<i>Variable</i>	<i>Source</i>	<i>Description</i>
<i>School level variables</i>		
Years of experience	Principal questionnaire	Range from 0 to 60
Formal education	Principal questionnaire	1: Did not complete ISCED Level 6; 2: ISCED Level 6; 3: ISCED Level 7; 4: ISCED Level 8.
Emphasis on academic success	Principal questionnaire	1: Medium Emphasis; 2: High Emphasis; 3: Very High Emphasis
School discipline	Principal questionnaire	1: Moderate to Severe Problems; 2: Minor Problems; 3: Hardly Any Problems
Socioeconomic background	Principal questionnaire	1: More Disadvantaged; 2: Neither More Affluent nor More Disadvantaged; 3: More Affluent
Hours of professional development	Teacher questionnaire	1: None; 2: Less than 6 hours; 3: 6–15 hours; 4: 16–35 hours; 5: More than 35 hours
<i>Student level variables</i>		
Student achievements	Cognitive questionnaire	Plausible values in mathematics and science
Bullying	Student questionnaire	1: Never or Almost Never; 2: About Monthly; 3: About Weekly
Sense of belonging	Student questionnaire	1: Little Sense of School Belonging; 2: Some Sense of School Belonging; 3: High Sense of School Belonging

Source: TIMSS 2019 data

The linear regression models are based on the following equation:

$$\text{Achiev} = \beta_0 + \beta_1 P_{\text{Exp}} + \beta_2 P_{\text{Edu}} + \beta_3 P_{\text{Emph}} + \beta_4 P_{\text{Disc}} + \beta_5 T_{\text{Devel}} + \beta_6 S_{\text{Bull}} + \beta_7 S_{\text{Belon}} + \beta_8 P_{\text{SEB}}$$

where **Achiev** indicates school achievements (in mathematics or science); **P_{Exp}**, **P_{Edu}**, **P_{Emph}**, **P_{Disc}** and **P_{SEB}** indicate the experience, formal education, emphasis on academic success, school discipline and socioeconomic background as reported by principals, respectively; **T_{Devel}** indicates the hours of professional development as reported by teachers; **S_{Bull}** and **S_{Belon}** indicate bullying and sense of belonging as reported by students, respectively.

Based on the existing literature, we hypothesize that the student variables will correlate positively with achievements, i.e. that a lower bullying and a higher sense of belonging will be associated with higher scores in mathematics and science, both for 4th and 8th grade. Moreover, principal-related variables such as emphasis on academic success and school discipline will be correlated positively with achievements, due to the positive impact they may have on school climate and student wellbeing. On the other hand, the experience or the level of education of principals may have varying effects depending on the country, subject, or grade considered. Lastly, the professional development of teachers may present a negative estimation, given that teachers who are more in need of professional development are generally also less experienced, which may in turn cause lower school achievements. Given the significant impact of socioeconomic background on the general wellbeing, school life and resource availability, we can also expect that socioeconomic background will correlate positively with achievements.

4. Findings and discussion:

In the first specification (1), we regress educational achievements in mathematics and science (separately) against the school leadership variables, namely the experience of principals, their formal education, emphasis put on academic success, and school discipline; in addition, we consider the hours of teacher professional development. In the second specification (2), we add bullying and the sense of belonging of students. In the third specification (3), we add the socioeconomic background to (1); while the fourth specification (4) again adds the socioeconomic background to (2). Table 2 presents the summary statistics for Saudi Arabia. Table 3 and Table 4 present the results of the regressions for 4th and 8th grade in Saudi Arabia, respectively.

Table 2. Summary statistics, Saudi Arabia

	4 th grade				8 th grade			
	Mean	St. dev.	Min	Max	Mean*	St. dev.*	Min	Max
Mathematics achievements	403.73	101.90	47.62	739.53	402.86	84.69	124.67	713.59
Science achievements	408.81	112.48	12.64	740.97	446.60	95.71	114.67	746.54
Experience	8.57	6.75	0	33	7.99/8.01	7.38/7.31	0	39
Formal education	2.06	0.57	1	4	2.05/2.04	0.36/0.35	1	4
Emphasis on success	2.09	0.62	1	3	1.91/1.94	0.64/0.66	1	3
Discipline	2.46	0.75	1	3	2.36	0.77	1	3
Maths prof. development	3.50	1.17	1	5	3.39	1.18	1	5
Science prof. development	3.31	1.31	1	5	3.51	1.19	1	5
Bullying	1.66	0.75	1	3	1.37	0.63/0.62	1	3
Sense of belonging	2.56	0.64	1	3	2.31	0.68/0.67	1	3
Socioeconomic background	2.22	0.76	1	3	2.29/2.32	0.77/0.76	1	3

Note: *two values are shown due to differences in the sample between mathematics and science (the first value refers to mathematics, the second value refers to science)

Table 3. School leadership and achievements in Saudi Arabia, 4th grade

	Mathematics				Science			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Experience	-0.46	-0.31	-1.29	-0.93	-0.84	-0.62	-1.56	-1.10
Formal education	5.37	9.81	-2.48	1.99	-7.51	-0.51	-17.43	-9.26
Emphasis on success	19.34**	18.55**	9.15	9.41	29.41***	27.02***	15.63	15.36
Discipline	5.03	3.87	13.94	12.86	5.01	3.35	14.69	13.24
Professional development	6.86	4.11	3.26	2.13	9.11*	6.26	11.14*	8.98*
Bullying		-		-		-		-
		29.12***		28.69***		39.80***		-37.84***
Sense of belonging		3.63		-1.12		4.56		-0.40
Socioeconomic background			19.99***	14.27*			29.42***	21.82**
Constant	315.05***	363.66**	306.55**	368.73**	320.06**	384.20**	280.12**	357.54***
		*	*	*	*	*	*	*

Note: *indicates $p < 0.05$; **indicates $p < 0.01$; indicates *** $p < 0.001$.

Table 4. School leadership and achievements in Saudi Arabia, 8th grade

	<i>Mathematics</i>				<i>Science</i>			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
<i>Experience</i>	0.15	0.27	0.31	0.49	0.25	0.38	0.01	0.25
<i>Formal education</i>	8.88	11.68	5.85	8.07	7.60	10.65	2.55	5.00
<i>Emphasis on success</i>	18.30***	15.66***	14.73**	11.89**	26.02** *	22.10** *	27.22** *	22.60***
<i>Discipline</i>	6.85*	7.03*	4.21	4.72	10.80**	9.94**	5.79	5.69
<i>Professional development</i>	3.86	2.90	7.29**	6.54*	7.13**	5.50*	7.80*	6.45*
<i>Bullying</i>		-20.92***		22.86** *		33.15** *		-33.52***
<i>Sense of belonging</i>		2.38		5.08		2.01		4.74
<i>Socioeconomic background</i>			8.04	7.85			3.38	4.09
<i>Constant</i>	309.09** *	335.19***	296.96* **	319.97* **	314.70* **	365.69* **	326.85* **	369.97***

Note: *indicates $p < 0.05$; **indicates $p < 0.01$; indicates *** $p < 0.001$.

In general, the results from Saudi Arabia present some interesting patterns. As predicted, the socioeconomic background is always significant in increasing the achievements, but only in 4th grade and more in science than in mathematics, indicating that more affluent schools are able to provide a higher quality of education to students, that is reflected in their educational achievements. The years of experience of principals and their formal education do not show any significant estimation, in any of the models considered.

On the other hand, the emphasis put on academic success is significant and positively associated with educational achievements, but noticeably this significance is lost when accounting for the socioeconomic background in 4th grade; on the contrary, the significance remains after accounting for socioeconomic background in 8th grade. This indicates how emphasis on academic success may be strongly dependent on the affluence of the school for lower school grades, while for higher grades it can have a positive association in itself with achievements.

One important result is that more frequent instances of bullying have a strong and negative impact on educational achievements, as it could have been expected, both in 4th and in 8th grade. In addition, school discipline presents a positive and significant association with achievements in 8th grade, which is nonetheless lost after accounting for socioeconomic background. For this reason, it is crucial for school principals to ensure that students can live in safe schools, and that they can report any instances of misbehavior and bullying to school authorities. In addition to improving educational achievements, this can also help prevent significant physical and psychological harm for students.

These results suggest that school leadership practices may be strongly influenced by the school belonging to a certain level of socioeconomic background. Nonetheless, some practices maintain their significance, although possibly with a decreasing magnitude, which can indicate how their impact depends on the affluence of the school. Moreover, bullying is significantly and consistently associated with a decrease in educational achievements, indicating how principals should consider interventions to reduce this phenomenon as urgent and crucial for achievements and well-being of students.

Although the results vary between other GCC countries, they show some consistent patterns similar to Saudi Arabia, summarized in Table 5. In Bahrain, the emphasis on academic success does not have a significant association with achievements in 4th grade, while it has it in 8th grade. School discipline remains significant in all the model specifications in 4th grade. Additionally, in Bahrain, there seems to be evidence of a positive impact of an increased sense of school belonging on educational achievements, but only in 8th grade. In Kuwait, similarly to Saudi Arabia, the emphasis on academic success and school discipline remain significant in all the specifications in 4th grade, while only the former remains so in 8th grade. Similarly, bullying and sense of belonging present similar estimations to Bahrain's.

Oman presents more significant results. In particular, the principal's formal education presents robust significance in 8th grade.

The emphasis put on academic success remains consistently correlated with achievements in 4th and in 8th grade, while school discipline does so in 8th grade only. In this country, bullying and student sense of belonging have significant coefficients, negative for the former and positive for the latter. In the country, the socioeconomic background of the student body also has a positive association with achievements.

In Qatar, the formal education of principals is consistently and significantly positively correlated with achievements, both in 4th and in 8th grade. The emphasis on academic success presents positive and significant coefficients in 8th grade. As with other countries, less frequently bullying and higher sense of belonging correlate with higher educational achievements. Socioeconomic background also remains significant in all the model specifications. Importantly, a negative coefficient for the professional development of teachers can be seen: this can indicate how less experienced teachers (who may need more hours of professional development) may not be able to convey their knowledge to students, thus leading to lower scores.

In the United Arab Emirates, the emphasis put on academic success and school discipline are significantly and positively correlated with achievements both in 4th and in 8th grade. The formal education of principals is also positively associated with scores, but only in 8th grade. As before, higher bullying and a lower sense of belonging correlate with lower educational achievements. The socioeconomic background is positively associated with achievements but only in 8th grade. As in the case of Qatar, the professional development of teachers shows a negative and statistically significant coefficient.

Table 5. Summary of significant results for the GCC countries

	4th grade	8th grade
Bahrain	Discipline, bullying	Emphasis on success, bullying, sense of belonging
Kuwait	Emphasis on success, discipline, bullying, sense of belonging	Emphasis on success, bullying, sense of belonging
Oman	Emphasis on success, discipline, bullying, sense of belonging, socioeconomic background	Formal education, emphasis on success, discipline, bullying, sense of belonging, socioeconomic background

	4 th grade	8 th grade
Bahrain	Discipline, bullying	Emphasis on success, bullying, sense of belonging
Qatar	Formal education, professional development, bullying, sense of belonging, socioeconomic background	Formal education, emphasis on success, bullying, sense of belonging, socioeconomic background
Saudi Arabia	Bullying, socioeconomic background	Emphasis on success, bullying
United Arab Emirates	Emphasis on success, discipline, professional development, bullying, sense of belonging	Formal education, emphasis on success, discipline, professional development, bullying, sense of belonging, socioeconomic background

Source: own estimations. Note: only the results consistent across specifications are shown.

The results from country regressions, summarized in Table 5, show how the estimations for Saudi Arabia differ in some respect compared to the ones of the other GCC countries. While there are some differences also between the GCC countries, Saudi Arabia presents some specific differences which are worth highlighting. In the country, the achievements of 4th grade students show a positive association with socioeconomic background, and a negative one with bullying; moreover, the achievements of 8th grade students are positively associated with socioeconomic background, emphasis on academic success, and negatively with bullying in mathematics; in science, socioeconomic background loses its significance. Variables such as school discipline or student sense of belonging do not show consistent associations with achievements, contrary to what happens in the other GCC countries. An investigation of the possible determinants of these differences can be helpful for policymakers in the country in order to better understand the dynamics of school leadership and its effect on student achievement.

5. Conclusions and policy recommendations

We ran several OLS regressions, with different specifications, with the aim of assessing which school leaders' characteristics and school leadership practices are associated with higher educational achievements in mathematics and science, using data from the 2019 TIMSS assessment for the GCC countries. Our research questions

were: whether school leadership practices are indeed correlated with achievements, and is this correlation lost once accounting for the socioeconomic background of the school. Moreover, following evidence from literature, we accounted for the possibility that this effect is indirect rather than direct. The comparative analysis allowed to assess whether the results were consistent across countries and between 4th and 8th grade, and between mathematics and science. We found evidence that confirms our hypothesis of an impact of school leadership practices on educational achievements, indicating that principals can make a difference when it comes to the attainments of students. Our results indicate that there are several channels to achieve this, including emphasizing academic success and improving school safety.

In general, the socioeconomic background of the school has a substantial impact on the significance of the correlations found in the model specifications, meaning that the level of economic disadvantage of schools and students is one of the most relevant determinant of educational achievements, and may additionally alter the effect of other variables and leadership practices. This is in line with the existing literature on the topic, and in particular with the evidence provided by Coleman et al. (1966), who considered the relationship between education and economic inequalities. In general, even when correlation remained significant after accounting for the latent profile of socioeconomic background, its magnitude was decreased, indicating a moderating effect of the economic disadvantage on the other variables. It is therefore important to improve the conditions of the most disadvantaged schools in all countries, as it would positively impact achievements as well as overall life conditions and opportunities for students.

The most consistent finding across countries is that the emphasis put on academic success from school principals is positively and significantly associated with higher educational achievements, especially so in 8th grade, when students are older. Similarly, school safety has a positive and significant impact on achievements, both in

terms of discipline and bullying experienced by students. Thus, it is recommended to principals to emphasise the importance of academic success to students, and make sure that their schools maintain a satisfying level of safety. This, crucially, is also visible when looking at the association between bullying and achievements, which is consistently and strongly negative, indicating that more frequent instances of bullying correlate with lower achievements. Both these elements can be beneficial for educational achievements irrespective of the socioeconomic background of the school. These results can be relevant in the context of the GCC countries. In particular, the indication to focus on academic success and school safety may be helpful for school principals when shaping their leadership style and effectiveness, which are relevant concerns for principals in the region (Bailey et al., 2021).

Principals' personal characteristics are not consistently correlated with achievements. In particular, their experience and formal education express mixed results across countries, with the latter showing a positive association with achievements and mostly in 8th grade. Additionally, these effects decrease after accounting for the socioeconomic background, indicating how crucial it is to first improve the standards of the most disadvantaged schools before focusing on school leadership practices. Again, it is worth stressing that this can be important in terms of the requirements to become principals (Bailey et al., 2021), suggesting that it could be more advisable to address the needs of the most disadvantaged schools first.

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