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An Experimental Investigation of the Determinants of Teacher Quality: Risk, Patience or Altruism?

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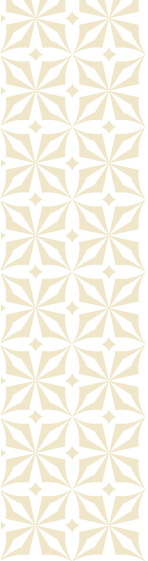


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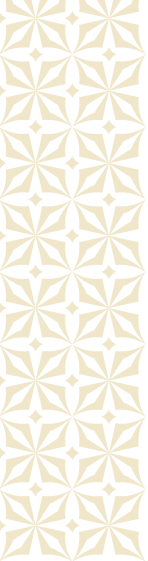
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Executive Summary

In seeking to develop a strong national workforce to support its long-term economic development, the United Arab Emirates (UAE) has placed an exceptional amount of emphasis on improving the quality of education. Nevertheless, public school students continue to perform poorly compared to their counterparts in international assessments such as the Program on International Student Achievement (PISA), Progress in International Reading Literacy Study (PIRLS), and Trends in International Mathematics and Science Study (TIMSS) (International Association for the Evaluation of Education Achievement [IEA], 2011; Mullis, Martin, Foy, & Drucker, 2012; Organisation for Economic Co-operation and Development [OECD], 2013; Ridge, 2014). In addition, a segregated learning environment in which male, non-Emirati teachers teach boys and female, Emirati teachers teach girls has allowed for girls to outperform their male peers in every subject on both national and international school assessments (IEA, 2011; Ministry of Higher Education and Scientific Research [MOHESR], 2015).

One possible factor that could account for these gendered differences in student achievement is widely believed to be teacher quality. However, existing research has found only weak or inconsistent relationships between traditional, observable measures of teacher quality, such as teacher content knowledge; years of experience; education levels, with student achievement (Darling-Hammond, 2000; Muñoz & Chang, 2007). To date there has been very little existing research that examines the impact of unobservable teacher characteristics such as teacher behavior on student achievement. This working paper therefore presents the results of research that extends the existing literature on the relationship between teacher characteristics and student achievement by exploring the impact of unobservable teacher characteristics (in this case behavioral traits) on student achievement in English.

Using lab-in-the-field experiments, 118 teachers in the emirate of Ras Al Khaimah participated in risk, patience, and altruism tasks. Results suggested that female teachers were more risk-averse (less-polarized distributions), patient, and altruistic than male teachers. Moreover, we found that students of risk-averse teachers had higher scores on average than their risk-seeking counterparts. Finally, risk-seeking and impatience had a more detrimental impact on student achievement for the students of male teachers (boys) than for the students of female teachers (girls). With these findings in mind, we see a need for a larger study to further assess the impact of the nationality segregated nature of the UAE's teaching sector on teacher behavior, and on the relationship between teacher behaviors and students' performance. We also recommend a review of expatriate teacher employment terms and of national teacher incentives to equalize the working conditions of teachers in boys' and girls' schools and to attract and retain Emiratis (both males and females) to enter the teaching profession in order to improve overall student achievement.



Introduction

With the advent of the discovery of oil in the 1950s in what was previously known as the Trucial States of the lower Arabian Gulf, the United Arab Emirates (UAE) embarked on a rapid development of its education sector with the introduction of Western-style mass public schooling for both girls and boys. Today, however, the UAE public education system faces critical challenges that have left its students struggling to compete internationally with other students from around the world (International Association for the Evaluation of Education Achievement [IEA], 2011; Mullis, Martin, Foy, & Drucker, 2012; Organisation for Economic Co-operation and Development [OECD], 2013). While UAE students overall are performing well below international averages, UAE males are particularly at risk with grades and scores far below their female counterparts (Ridge, 2014).

Results from international assessments such as the Program on International Student Achievement (PISA), Progress in International Reading Literacy Study (PIRLS), and Trends in International Mathematics and Science Study (TIMSS) demonstrate that Emirati girls performed higher on every subject than their male counterparts between 2007-2011 (IEA, 2011; Mullis et al., 2012; OECD, 2013; Ridge, 2014). Boys also lag behind girls in national assessments like the General School Certificate Examinations where girls continued to surpass boys with the percentage of year 12 girls in the 90-100% bracket triple that of boys across all subjects in 2005 (Ridge, 2014). One subject where some of the largest differences are observed is English. In 2012, grade 9 and 12 girls outperformed boys in their final English results by 13.4% and 16.9%, respectively (Ministry of Education [MOE], UAE, 2013).

In order to understand the factors affecting student achievement and the resultant gender disparities, this paper first discusses the unique institutional context of the UAE education sector, in which female, largely Emirati, teachers teach girls, and male, largely non-Emirati, teachers teach boys. We hypothesize that this environment has contributed to differences in the behavioral attributes of teachers in male versus female schools. We also hypothesize that female teachers in particular may hold certain, more favorable behavioral characteristics, as a result of their nationality, that may result in better girls' achievement in public schools than boys.

In order to explore these hypotheses, the paper then examines previous research on known factors that influence student achievement. We found that while existing research concludes that teacher quality is important for student learning, it does not agree on what specific teacher characteristics define teacher quality and affect student achievement. In fact, the existing literature has established that overall, students do not perform better with teachers who have stronger credentials, such as higher standardized examination scores (content knowledge), more years of experience, or even higher education levels (Hanushek & Rivkin, 2012). This therefore leaves many questions about what actually makes an effective teacher. One possible answer, we believe, may lie in a better understanding of the unobservable traits of teachers, that is, their behavioral characteristics.

The paper therefore investigates the potential impact of three behavioral characteristics of teachers on student performance: risk-aversion, patience, and altruism. We also tested whether male, non-Emirati and female, Emirati teachers behaved differently and report the results in the findings section of this paper. Finally, we conclude our paper by summarizing the above and offering some policy recommendations on ways forward.

Education in the United Arab Emirates (UAE)

The unique institutional features and policies of the UAE’s gender-segregated public education system seemingly create a great deal of variation in teacher characteristics. Girls and boys are segregated by gender at all ages and taught by teachers of the same gender from grade 6 onwards. Prior to that, female teachers form the majority of teachers at public schools. In 2012, female teachers accounted for close to 100% of teachers at the primary level and 58% of teachers at the secondary level, all of whom are teaching girls (Ridge, 2014; Ridge, Shami, & Kippels, in press).

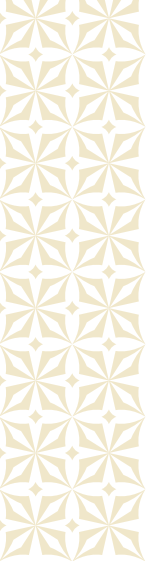
In addition to teacher gender, the UAE’s public education system also inadvertently segregates teachers by nationality. While the country has been successful in attracting Emirati females to the education profession, it has been largely unsuccessful in attracting Emirati males. As of 2014, 65% of female teachers were Emirati while only 11% of male teachers were Emirati (Ministry of Education [MOE], UAE, 2014). Ridge et al. (in press) found that approximately 80% of these male teachers are sourced from countries like Egypt, Syria, Jordan, and Palestine.

The salary scales and terms of employment of Emirati (largely female) teachers differ vastly from those of non-Emirati (largely male) teachers. Table 1 summarizes these institutional differences and shows that, in general, expatriate teachers have lower salaries, shorter contracts, fewer benefits and training, less promotional opportunities, and lower mobility.

Table 1. Institutional Differences between Emirati and Expatriate Teachers

Characteristics	Emirati teacher		Expatriate teacher	
	Married	Unmarried	Married	Unmarried
Monthly salary (in AED) ^a	≈ 25,000	≈ 24,000	≈ 10,000	≈ 9,000
Contract duration	Indefinite		One year renewable	
Additional benefits	Housing, school allowance, pension, job security		None	
Ability to request transfer	Yes		No	
Training opportunities	Eligible for free/subsidized master’s and doctoral degrees, all MOE-run courses		Eligible for MOE-run courses only (and other free courses provided by nonprofit organizations)	
Promotion capacity	Yes, up to principal		Limited, up to subject supervisor	

^a Source: MOE, personal communication, November 15, 2016



Previous research from the UAE has found that this divided education system is a cause for concern. First, according to Farah (2011), male, non-Emirati teachers were found to be more likely to engage in private tutoring as an income-supplementing activity than their female, Emirati counterparts, regardless of qualifications. Such activities may be perceived as risk-seeking behavior since they lie outside of legal bounds on employment. Second, inside the classroom female, Emirati teachers have been found to pace and structure lessons more effectively than their male, non-Emirati counterparts (Ridge, 2009). This can be indicative of more patient behavior on the part of female teachers. Finally, in the same study, female, Emirati teachers were found to spend more out-of-pocket on learning-aids for their students (Ridge, 2009). This behavior could be construed as more altruistic behavior on the part of female teachers over and above the fact that female teachers may have more disposable income.

These findings coupled with the knowledge that male students are lower-performing than their female counterparts in every subject in school leads us to question whether (1) female teachers do in fact hold characteristics that are more beneficial to student learning, and (2) whether teacher behavior, namely with regards to risk, patience, and altruism, has an impact on student achievement. Before proceeding to explore these three behavioral attributes in more detail, we examine what previous literature has concluded on the impact of non-behavioral teacher characteristics on student achievement.

Factors Affecting Student Achievement

Existing literature examining teachers and students generally supports the notion of teacher quality as a strong predictor of student achievement (Darling-Hammond, 2000; Muñoz & Chang, 2007; Nye, Konstantopoulos, & Hedges, 2004; Rivkin, Hanushek, & Kain, 2005; Rockoff, 2004; Stronge, Ward, Tucker, & Hindman, 2008). In a statewide longitudinal study of primary school students in Tennessee, Wright, Horn, and Sanders (1997) used data from the Tennessee Value-Added Assessment System (TVAAS) to measure the impact of teacher effects while simultaneously controlling for the influences of intra-classroom heterogeneity, student achievement level, and class size on academic gains in five subjects. They found that the most important factor affecting student learning is the teacher and that effective teachers contribute to learning gains for students of all achievement levels, regardless of the level of heterogeneity in their classrooms.

However, what constitutes an “effective teacher” remains undecided by researchers. Some research explored specifically the impact of pedagogical training received during a teacher’s schooling in particular on student outcomes. Monk (1994) analyzed the test scores of almost 3,000 high school students in mathematics and science from the Longitudinal Study of American Youth in the span of three years in 10th, 11th, and 12th grades and found that the number of mathematics and science education courses (pedagogy) taken at both the undergraduate and graduate levels by the teacher was positively related to high school students’ achievement in math and science.

Ballou and Podgursky (1998), on the other hand, contended that pedagogical training matters less than knowledge of subject matter insofar as the literature on the significance of pedagogical training is inconclusive, and regulations requiring potential teachers to undergo more training at their own cost may deter otherwise high-quality teachers from entering the profession.

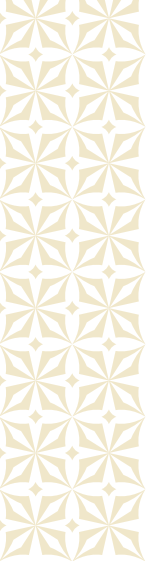
Rivkin, Hanushek, and Kain (2005) use longitudinal data for three cohorts of grade 3 through 7 students in Texas in the 1990s to investigate the impact of teacher experience and education on students. They find that while teachers have strong effects on students' achievement in mathematics and reading, particularly in the first year of teaching, there is no statistically significant evidence that a master's degree or another year of experience following the third year improves student scores.

In the Middle East, Badr (2010) used randomized trials and natural experiments in Egypt to measure the impact of other observable teacher characteristics on student performance. He found that differences in teachers' educational background, years of experience, and teaching certification did not have an impact on student achievement on the Trends in International Mathematics and Science Study (TIMSS) standardized examinations in both math and science. In fact, contrary to common perception, for girls only (not for boys), students who had teachers with a postgraduate degree performed 60 points lower on tests than students whose teachers did not hold a university education. Similarly, students who had teachers with a university degree performed 34 points lower than students whose teachers did not hold a university degree.

In his research of over two decades of investigating the impact of several key educational resources on student achievement, Hanushek (1981, 1986, 1996, 1997), however, concluded that there was no systematic relationship between observable traits of teacher quality and student achievement. With respect to teacher education, Hanushek (1997) identified 171 estimates investigating its impact on student achievement, 9% of which he reported to be statistically significant and positive, 5% of which were statistically significant and negative, and 86% of which were statistically insignificant. With respect to estimates of teacher test scores and teacher experience, the results are similar, with more than half of those estimates found to be statistically insignificant. Thus, based on Hanushek's research, teacher education and experience do not really matter. This is consistent with our hypothesis that observable teacher characteristics do not impact student achievement significantly and that perhaps other variables of teacher quality, such as teachers' behavioral characteristics, need to be explored.

Application of Behavioral Economics

The previous literature on the link between teacher characteristics and student achievement largely considers observable educational and socio-demographic factors, such as teacher experience, education, and teacher content knowledge, in models measuring student achievement. However, no studies have attempted to analyze the impact of unobservable behavioral characteristics of teachers on student achievement. Theories of intrinsic motivation, hyperbolic preferences, and non-financial rewards can be applied to everyday education



problems and provide insight into the behavioral regularities of teachers, students, parents, and administrators that cannot be explained by conventional educational analyses.

Three key behavioral characteristics — risk, patience, and altruism — have been commonly used in social research to explain variations in individual outcomes. **Risk** can be defined in a number of ways. For entrepreneurs, risk may come in the form of an investment that is susceptible to financial loss (Eckel & Grossman, 2008). For doctors, on the other hand, risk can be ordering fewer laboratory tests for patients, taking less time per patient, and referring patients to consultants fewer times (Fiscella et al., 2000). Certain people may also be more susceptible to taking risks, or more risk-seeking. Dohmen et al. (2011) investigate risk attitudes in general and find that gender, age, height, and parental background are all significantly related to willingness to take risk and that risk attitudes change depending on the context of the risk taken.

In the medical sector, the impact of the risk preferences of family physicians and internists on hospital costs per patient were investigated by Fiscella et al. (2000). It was found that family physicians were more likely to take risks (less risk-averse) than internists when it came to treating patients. In this study, being less risk-averse was associated with lower medical costs per patient. Therefore, physicians who were less risk-averse had lower costs per patient than internists who were more risk-averse. In this paper, we apply this test to the education sector and ask whether elicited risk preferences of teachers correlate with student test scores; in other words, are more (less) risk-averse teachers associated with higher or lower student test scores?

The second behavioral attribute we consider is **patience**. Patience is defined as a preference for a payoff in the future (Thaler, 1981). Research has found that people in many contexts exhibit time preferences in line with hyperbolic discounting. That is, in the short term, people choose smaller benefits over larger ones and thus have steeper discount rates (Thaler, 1981). After a certain point in time, however, individuals prefer larger, more delayed benefits over smaller, more immediate ones.

In one experiment, Meier and Sprenger (2010) elicit subjects' willingness to pay (WTP) in today's dollar for one month from today, six months from today, or future dollar amounts seven months from today. Their findings are in line with hyperbolic discounting, and they find that subjects are generally present-biased as they prefer today's dollars sooner over those in the future. In terms of the impact of patience on consumer behavior, Meier and Sprenger (2010) find that individuals who exhibit present-biased behavior and are less patient, have lower credit scores and higher credit card debt. We adapt Meier and Sprenger's findings to the education sector in this study and we ask whether teachers who are more (less) patient than others are associated with higher (lower) student test scores.

Finally, **altruism**, the deviation from self-interest, is the third behavioral characteristic that we explore. Altruism is defined by behavioral economists as the forgoing of maximum individual payoffs to improve other people's payoffs (Engel, 2011). People are theoretically assumed to be self-interested in classical economic analyses. However, in a meta-analysis involving over 100 experiments, Engel (2011) finds that if given the role of a dictator who decides the division of payments between other players in a game, the dictator will offer, on average, 28.35% of his

endowment to other players.

When testing whether men or women are more altruistic, Andreoni and Vesterlund (2001) find that when the offer is cheap, men are more altruistic and when the offer is more expensive, women are more altruistic. In medical psychology research, it was found that altruism is associated with improvements in health and life longevity of the person practicing altruism (Post, 2005). However, no known studies have looked at how altruism can impact the outcomes of other individuals. In this paper, we use a form of dictator game to investigate whether more (less) altruistic teachers are associated with higher (lower) student test scores.

The next section will illustrate how the above research on the applications of behavioral economics was used to design the study.

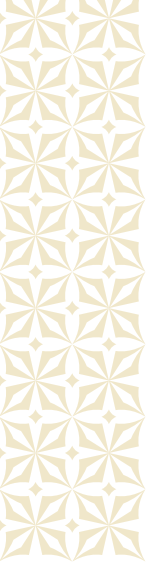
The Study

This paper uses a standard least-squares regression to estimate the impact of unobservable teacher behavioral measures, namely risk, patience, and altruism, on student achievement in English in the United Arab Emirates (UAE). We chose English as the subject of interest for two primary reasons. First, proficiency in English, marked by a minimum score of 180 in the Common Educational Proficiency Assessment (CEPA), is a requirement for entry to federal universities in the UAE. Second, data on teacher content knowledge of English was available to the authors in the form of the Test of English as a Foreign Language (TOEFL) scores. Similar data was not available for other subjects, and therefore, could not be matched with the student scores to estimate the impact of teachers on student achievement.

In order to evaluate the model, we employed three datasets and three experiments. The first dataset was composed of teachers' TOEFL scores collected from all 400 public school English language teachers in the emirate of Ras Al Khaimah (RAK), UAE in 2012. The TOEFL tests were administered by AMIDEAST to ensure the validity and reliability of the results and conducted in collaboration with the Ministry of Education (MOE). The second dataset was attained from a survey distributed to all teachers who participated in the experiments and measured non-behavioral characteristics of teachers including teacher gender, nationality, and experience. The final dataset consisted of public school student scores in English for grades 1 through 12 in RAK and was attained from the MOE.

For the experiments, all 400 English teachers were contacted, of which 118 chose to participate in gender-segregated field experiments in 2013. The experiments measured teachers' attitudes to (1) risk, (2) patience, and (3) altruism using tasks adapted from previous literature.

After all datasets were gathered and the experiments conducted, behavioral and non-behavioral measures of teacher quality were matched with their student's test scores in a master-database. The resulting regression analyzed the effectiveness of teachers on student achievement after controlling for school-specific effects, teacher content knowledge (TOEFL scores), teacher socio-demographic characteristics, and teacher behavioral characteristics measuring risk, time, and altruism preferences.



Limitations

Despite the sophisticated experiments used in this study, there were a number of limitations that arose. First, the sample size of 118 teachers is small and therefore, limits our ability to draw any generalizations from this research. Second, the sample is also skewed. Nearly all female teachers were Emirati, uniformly younger, and with less experience than their male counterparts. On the other hand, all male teachers were non-Emirati and there was not a single male Emirati teacher in the sample. The teaching environment in the UAE where only around 10% of male teachers are Emirati (Ridge, 2014) makes it difficult to adequately select a representative sample. Finally, poor record-keeping by schools and official education governing bodies makes it impossible to attain longitudinal data for both the student and teacher samples.

Findings

Socio-demographic Characteristics of the Sample

The first step to understanding how teachers impact student achievement was to investigate the socio-demographic data on teachers (see Table 2). Unsurprisingly, due to the institutional context of the UAE where teaching is an attractive profession for female Emiratis but not males, we find that nearly all (approximately 90%) women who participated in the experiments were Emirati while the men were expatriate Arabs. In terms of observable measures of teacher quality, we found that female teachers were younger, less experienced, and had lower average TOEFL scores (content knowledge) than their male, non-Emirati counterparts. Paradoxically, however, female students taught by Emirati female teachers had higher average student scores than male students taught by more proficient in English, non-Emirati male teachers.

In addition to observing the socio-demographic characteristics of the teachers, we also measured the behavioral characteristics of male and female teachers by testing how they responded in three behavioral field experiments.

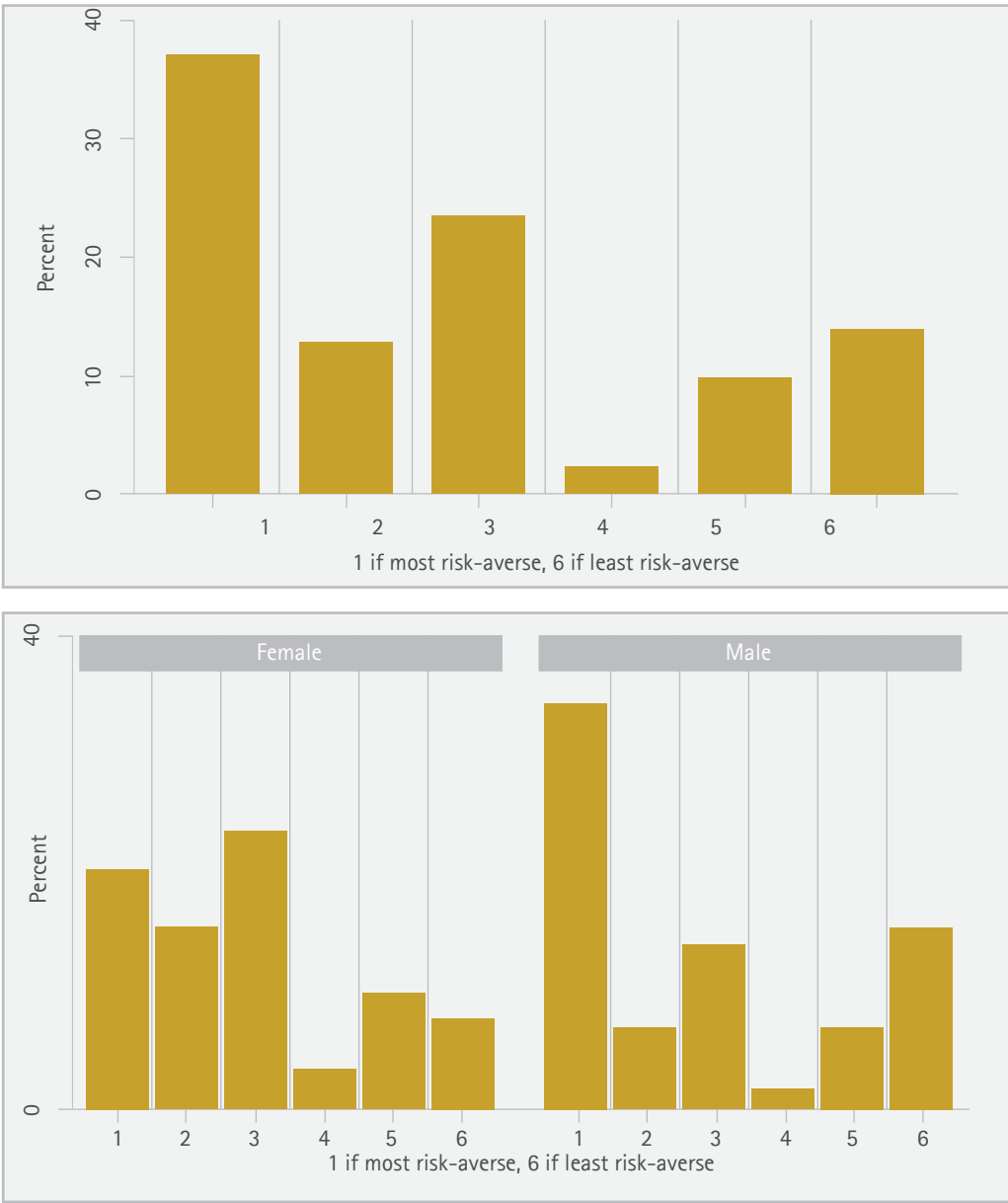
Table 2. Descriptive Statistics of the Sample

Variable	All	Female	Male
Age (Years)	38.90 (19.52)	30.43 (5.58)	46.05 (8.11)
Experience (Years)	14.82 (9.79)	7.22 (5.70)	21.23 (7.70)
TOEFL	490.96 (51.84)	481.52 (43.78)	498.92 (56.90)
Average Student Test Score (μ)	73.68 (9.30)	81.21 (6.00)	67.22 (6.28)
Standard Deviation (SD) of Student Test Scores (σ)	13.28 (2.79)	12.55 (1.86)	13.89 (3.27)
N	118	54	64

Experimental Results

The first set of experimental results illustrates how teachers responded to the risk task. The risk task measured teachers' inclination to take one of six hypothetical taxi routes¹ from Ras Al Khaimah (RAK) to Dubai each with a different given cost and probability of encountering traffic (risk). More high-risk routes also have a higher financial payoff. Figure 1 below plots the distributions of responses of male and female teachers and shows that **overall, teachers are generally more risk-averse than risk-seeking**. However, in terms of gender, male teachers have a more polarized distribution of risk where on one extreme, they are more risk-averse and on the other extreme, they seek out risk more than female teachers.

Figure 1. Distribution of Results for Risk Task



¹ See Appendix for screen-shot of the task.

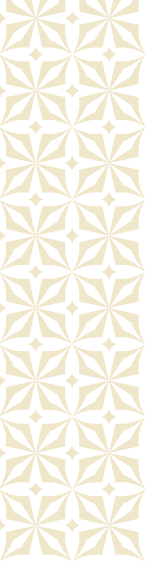
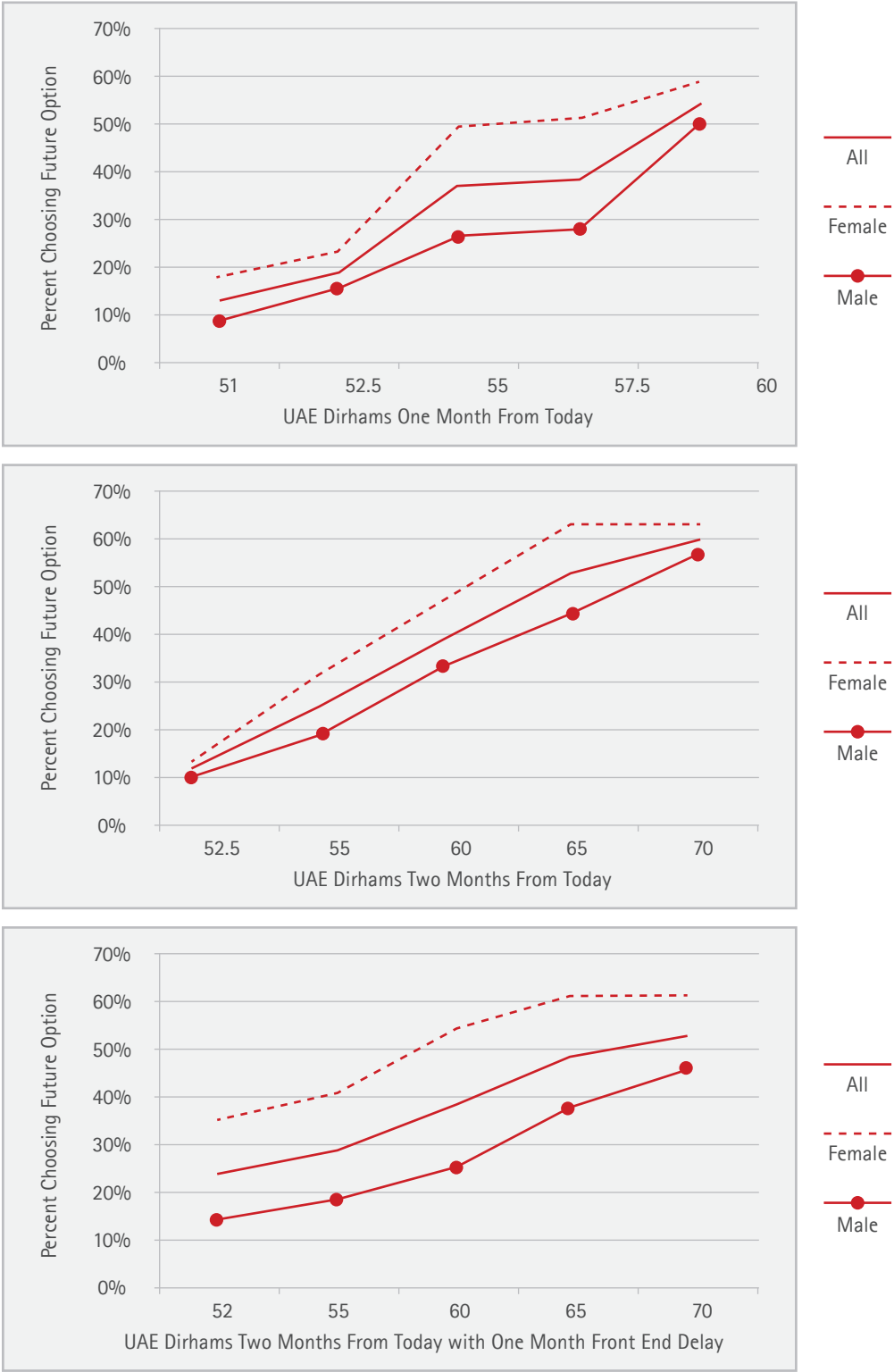


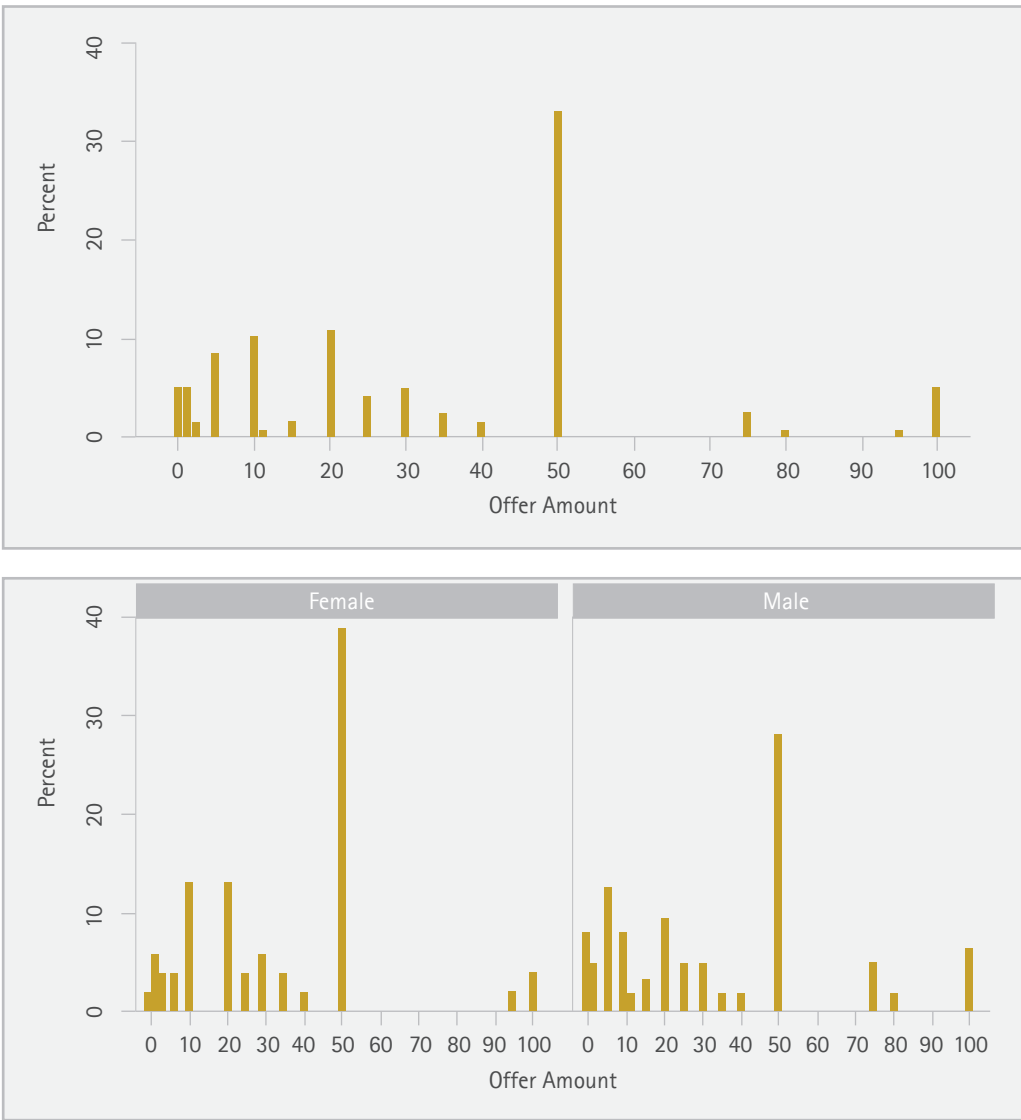
Figure 2. Patience Across Different Time Periods

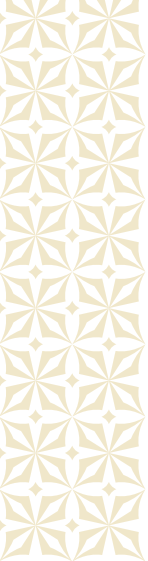


Similar tests were carried out to measure teachers' level of patience. In this task, teachers were given choices of receiving real money at different points in time². Present choices, for instance, meant that teachers preferred to receive their money today as opposed to one month from today, two months from today, and so on. Patience was thus measured by the number of present (impatient) choices made by teachers. In this task, we find that **female teachers significantly and uniformly made more patient choices than their male counterparts** (see Figure 2 on previous page). As can be seen in Figure 2, at all three time periods (one month from today, two months from today, and two months from today compared with one month from today), the percentage of females choosing the future option was higher than that of the males.

Finally, in the altruism task, participants were tested for the amount of the monetary offer they made to other participants³. The larger the monetary offer made to other participants (again using real money), the more altruistic the teacher. Figure 3 reveals that **most teachers were likely to offer 50% of their money to other participants, but female teachers offer the “fair” amount (50%) much more**.

Figure 3. Distribution of Results for Altruism Task





Regression Results

After examining general response patterns and gender differences in responses to the experimental tasks, we also explored the impact of behavioral characteristics from the experimental tasks on average student scores in English. We conducted two regressions. The first relates the average student scores (μ_i) to the experimental measures of risk, impatience, and altruism, teacher TOEFL scores, and teacher gender (see Table 3 on next page). The second regression specification repeats the exercise but uses gender as an interaction term to try to ascertain whether the effect of risk, patience, and altruism onto student achievement depends on the gender of the teacher (see Table 4 on next page).

For the first regression, we find that **students tend to perform better with more risk-averse teachers**. For the female teacher sample alone, this relationship is also found to be significant. However, the remaining behavioral correlates, namely impatience and altruism, do not seem to have a significant impact on student achievement.

Consistent with the summary statistics and distributions, we also find that teacher gender influences average student scores. That is, **students of female teachers perform higher on average than their male counterparts in English**. However, because female teachers are also significantly younger and are all Emirati, it is difficult to disentangle the effects of each of these variables and identify whether gender, age, or nationality play the largest role. In other words, age and nationality are confounding variables for gender.

Finally, we found that **for female teachers, lower TOEFL scores are associated with higher average student test scores**. This is consistent with previous research that finds that improved teacher content knowledge (or qualifications) does not lead to improved student test scores and does not help to explain why their students are doing better than students of teachers with a better command of the subject matter.

In the second regression where gender interacts with risk, patience, and altruism, we find that **students of risk-seeking and impatient male teachers perform lower than students of risk-seeking and impatient female teachers**. In other words, risk-seeking and impatience have a more detrimental impact on students of male teachers than on students of female teachers. Moreover, altruism does not affect student test scores, even when interacting with gender. Thus, having accounted for the unique institutional environment in the UAE, we find that overall, some behavioral characteristics of teachers are in fact correlated with student performance in English.

² See Appendix for screen-shot of the task.

³ See Appendix for screen-shot of the task.

Table 3. Regression Results for Average Student Test Scores (μ) as Dependent Variable

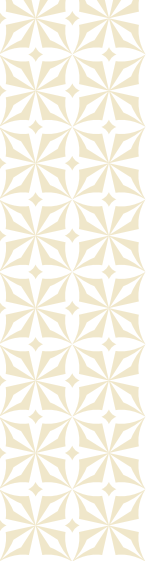
Variable	All Teachers	Female	Male
Risk	-0.573** (0.284)	-0.831* (0.473)	-0.410 (0.373)
Impatience	-0.026 (0.134)	-0.059 (0.156)	0.074 (0.228)
Altruism	0.005 (0.021)	-0.033 (0.032)	0.032 (0.028)
TOEFL	-0.006 (0.013)	-0.036** (0.017)	0.007 (0.018)
Gender (Male=1)	-13.82*** (1.236)		
Constant	85.89*** (6.607)	102.40*** (8.235)	63.09***
Observations	118	54	64
R ²	0.580	0.123	0.040

Note. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Regression for Interaction of Teacher Gender with Behavior

Variable	Average Score	SD of Scores
Risk X Gender	-1.341*** (0.361)	-0.023 (0.156)
Impatience X Gender	-0.750*** (0.125)	0.117* (0.064)
Altruism	-0.007 (0.024)	0.009 (0.011)
TOEFL	-0.004 (0.015)	-0.006 (0.007)
Constant	82.19*** (7.535)	15.21*** (2.970)
Observations	118	118
R ²	0.487	0.068

Note. Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$



Conclusions & Policy Recommendations

The relationship between teacher quality and student achievement is complex. While existing literature has investigated several forms of that relationship, few studies attempt to correlate the unobservable characteristics of teachers, such as behavior, with student test scores. By employing lab-in-the-field experiments, we found that English teachers working in Ras Al Khaimah government schools are generally more risk-averse than risk-seeking, but that female teachers are less polarized in their risk preferences. Female teachers were also found to be more patient and altruistic than their male, non-Emirati counterparts. This finding is in line with previous behavioral research on men and women from both the medical and consumer studies fields (Andreoni & Vesterlund, 2001; Meier & Sprenger, 2010). When analyzing the impact of teacher behavior on student achievement, we found that being risk-averse as a teacher improves student test scores. Moreover, we also found that being risk-seeking and impatient reduces student test scores more so for the students of male teachers (boys) than for the students of female teachers (girls).

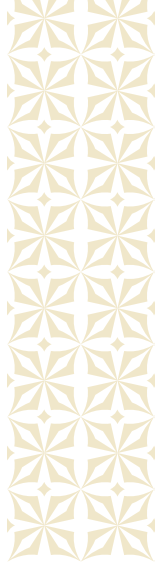
In terms of the implications for policy-making, this study makes an important case for examining how the current nationality segregated teacher sector may be negatively impacting the student achievement of boys versus girls. As we learned, virtually all female teachers were Emirati and younger than their male counterparts, while all male teachers were expatriates and older than their female counterparts. This is consistent with the composition of government school teachers in the emirate of Ras Al Khaimah. However, in other emirates such as Abu Dhabi and Dubai, there are a relatively larger number of female expatriate teachers (Federal Competitiveness and Statistics Authority [FCSA], 2015). In addition, we also know that male teachers work under fixed-term contracts and face higher levels of job insecurity than Emirati teachers due to a variety of reasons (Ridge et al., in press). Research from other sectors suggests that it is possible that the different employment terms and conditions enjoyed by these two groups could also shape their behaviors (AbdelRahman, Elamin, & Aboelmaged, 2012; Agwa & Salem, 2015). In our study, we found that female teachers exhibited more favorable behavioral traits than males and their students achieved higher results in examinations. Thus, the current employment conditions may be unintentionally leading to an intensification of the reverse gender gap in education in the UAE (Ridge, 2014).

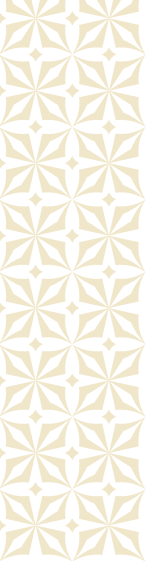
In order to better understand the current situation and potentially close the gender gap and raise overall student achievement, we therefore recommend the following:

1. Implementing this study with a larger sample that includes Emirati male teachers (as there were none in the current sample) and more expatriate females (as there were only six in this sample) to confirm/disprove the findings.
2. Recognizing and promoting awareness around the interplay between institutional features of a teaching environment and the behavioral characteristics of teachers themselves.
3. Incentivizing positive teacher behaviors, such as risk-aversion and patience among expatriate teachers in order to improve student learning. Strategies to do so may include

extending teacher contractual terms, more professional development opportunities, and the like. This could potentially mitigate effects of job insecurity and encourage more commitment to the education system.

4. Reviewing current national teacher salary scales, benefits, working conditions, and overall teacher status in the community with a view to encouraging more Emirati men to become teachers and to retain good Emirati female teachers (Buckner, 2016).

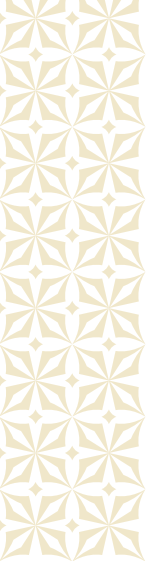




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Appendix

Risk Measure - "Taxi Task"

	Traffic	Cost of Taxi	Chances
Route 1	Low	28 AED	50 %
	High	28 AED	50 %
Route 2	Low	24 AED	50 %
	High	36 AED	50 %
Route 3	Low	20 AED	50 %
	High	44 AED	50 %
Route 4	Low	16 AED	50 %
	High	52 AED	50 %
Route 5	Low	12 AED	50 %
	High	60 AED	50 %
Route 6	Low	2 AED	50 %
	High	70 AED	50 %

Which route would you like to select.

☐ Route 1
☐ Route 2.
☐ Route 3
☐ Route 4
☐ Route 5.
☐ Route 6.

Please press CONTINUE.

CONTINUE

Altruism Measure - "Money Task"

You have been randomly matched with someone in this room. You have 100 AED. You can choose to give some of this money to your partner.

How much would you like to give?

OK

Patience Measure - "Time Task"




For each row please select an option on the left or right

AED 50.00 Today ☐ AED 51.00 AED One month from today.

AED 50.00 Today ☐ AED 52.50 AED One month from today

AED 50.00 Today ☐ AED 55.00 AED One month from today

AED 50.00 Today ☐ AED 57.50 AED One month from today

AED 50.00 Today ☐ AED 60.00 AED One month from today

Please press CONTINUE.




For each row please select an option on the left or right

AED 50.00 Today ☐ AED 52.00 AED Two months from today

AED 50.00 Today ☐ AED 55.00 AED Two months from today

AED 50.00 Today ☐ AED 60.00 AED Two months from today

AED 50.00 Today ☐ AED 65.00 AED Two months from today

AED 50.00 Today ☐ AED 70.00 AED Two months from today

Please press CONTINUE.




For each row please select an option on the left or right

AED 51.00 One month from today ☐ AED 52.00 AED Two months from today

AED 52.50 One month from today ☐ AED 55.00 AED Two months from today

AED 55.00 One month from today ☐ AED 60.00 AED Two months from today

AED 57.50 One month from today ☐ AED 65.00 AED Two months from today

AED 60.00 One month from today ☐ AED 70.00 AED Two months from today

Please press CONTINUE.



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