

Assessing Academic Underachievement and High Achievement among Pakistani Secondary School Students

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The present study was designed to assess academic underachievement among secondary school students in Pakistan. The underachievers were compared to high achievers on selected factors in school context (i.e., locality of the school as defined by Federal Board of Intermediate and Secondary Education, and type of school). Academic underachievement was measured through discrepancy between intelligence scores on Raven's Standard Progressive Matrices (Raven, 1983) and achievement scores (Federal Board result of 9th grade). Initially, a total 1139 students (48.9% boys; 51.1% girls) from 16 randomly selected secondary schools from four cities of Pakistan were approached. Two samples of students underachievers ($n = 213$) and high achievers ($n = 139$) were screened out on the basis of percentile scores on Raven's Standard Progressive Matrices. The analyses revealed 18.7% of participants were underachievers. Further, ANOVA and posthoc analysis showed significant group differences with reference to school context factors. Underachievement was highest among boys' urban Schools and lowest among boys' residential school. The findings have significant implications in social, economic, and cultural context of Pakistani schools.

Keywords. Underachievement, underachiever, achievement difference, achievement in school context

Academic underachievement has been an area of interest for researchers, educationists, parents, and learners from last few decades due to its detrimental effects. Literature has well established the significance to identify underachievement at secondary school

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education to deal the long term negative consequences (i.e., McCall, Beach, & Lau, 2000; McCoach, 2006). Physical (Compton, 1982) and psychological (Grobman, 2006) characteristics of adolescence make this stage in lifespan more prone to academic underachievement. Underachievement is inability of capable children to perform in school (Rimm, 2008). Broadly underachievement is defined as discrepancy between ability (Roach & Bell, 1989) and achievement or potential and performance (McCoach, 2006). On the other hand, in low achievement and high achievement, the achievement matches the ability (Jones & Myhill, 2004). Underachievement is measured discrepancy between some intelligence test scores and achievement scores in school. The assumption is that underlying intelligence is more than what a child has learned in curriculum and therefore predicts educational potential of the child (Jones & Myhill, 2004).

Despite a consensus on general definition of underachievement, there is much less agreement on specific method for identification of underachievement (Lua & Chan, 2001; McCall et al., 2000; Preckel et al., 2006; Ziegler & Stoeger, 2003). Operational definitions of underachievement range from using different cutoff points to using regression definition for establishing a set predictor of achievement based on intelligence. In using cutoff points, researcher use absolute cutoffs for both intelligence and achievement like taking 80th percentile of intelligence score and C grade or 60 percent for achievement. There could be a standard measure (e.g., percentile for both) and at least some notable discrepancy between both scores must exist. As evident in the approach itself, it is inconsistent as each researcher can set one's own cutoff point and somewhat subjective, but still it is frequently used due to its ease in application on a large sample (Preckel et al., 2006).

On the other hand, regression definition is used with more debatable advantages and disadvantages. Among the advantages of regression definition is its wide applicability. As the scores are converted to standardized scores for testing a predictable relationship, using different intelligence test or any particular scoring of achievement does not affect the basic regression definition. It also identifies underachievers among different range of abilities and also easy to use statistically in analysis and manipulation (McCall et al., 2000).

Using regression model to predict achievement from IQ has many shortcomings. The number of identified underachievers clearly depends on the regression criteria used and thus may indicate a measurement error rather than showing true prevalence (Ziegler et al., 2012). An allegation by Thorndike (as cited in Preckal et al., 2006) is

that underachievement, especially (but not exclusively) when defined by the regression approach, simply represents errors of prediction and is not a real psycho-educational syndrome. Although parents of underachievers and their counselors would wholeheartedly disagree that such children are mere errors of predictions, researchers must demonstrate that a quantitative or qualitative set of characteristics (or both) is associated with underachievement and distinguishes underachievers from high achiever children having the same ability and the same grades. A vast array of research also suggests otherwise (Krouse & Krouse, 1981) in favor of identifying underachievement qualitatively. However, combining psychometric with psychological assessment would definitely be more valid, reliable, and of greater importance.

Lau and Chan (2001) used simple difference score method in their research. According to this method, a discrepancy score was calculated by subtracting the standardized achievement score from the standardized intelligence score. Intelligence tests are often used in educational settings to predict children's academic settings to predict children's future academic progress. Abstract experiences are presumed to be best responded by more-able children. As a result, they progress at increased rate. Intelligence tests are, thus, used to estimate child's potential for learning. If the estimate is matched with child's achievement, the child is said to be 'achieving according to his potential' no matter what that level might be. Among these students there are low and high achievers, according to their low and high ability, respectively; whereas, the students identified, as of high ability while, achieving lower than what is expected from them are described as underachievers (Long, Wood, Littleton, Passenger, & Sheehy, 2011).

Importance of predicting achievement and following it is also linked with grade level of the student. Secondary school is the time when students are in their last year of school and studying all basic subjects to prepare themselves for admissions in colleges with subjects of their choice, which in turn, defining their future career choice. It is the transition period with emphasis on higher performance as it would serve as foundation of their future academic and professional career (Aslam, 2008). Early approaches to underachievement focused mainly on family and peers as the social context keeping schools out of debate. Family characteristics and 'poverty culture' have been considered as dominant causes of underachievement. On the other hand, mismatch of student's characteristics with streamlined curricular and organizational structure were the focus of underachievement study (Harris, 1996). However,

importance of schools in raising students' achievement has also being studied and supported in previous studies (Rutter, Maughan, Mortimore, Ousten, & Smith, 1979). Different researches have studied different factors as measures of school effectiveness, they can be collectively considered for the empirical basis of study based on role of school in underachievement of the students. It has significantly redirected the underachievement debate on effective teaching and learning minimizing the effect of family background. The studies have shed light on the importance of schools with the notion that schools' characteristics do make a difference in achievement of students (Reynolds, Hargreaves, & Blackstone, 1980; Rutter et al., 1979). School characteristics include both physical characteristics (school building and facilities) and social characteristics (interactions among students and teachers).

Literature provide sufficient support that focus of studies on underachievement shifted from outside to inside of school. School has been called as a major contributor in underachievement, while, earlier family was termed as a major cause of a student's inability to reach his/her full potential (Zilli as cited in Harris, 1996). A study by Aslam (2008) in Pakistan focused on identifying either school factors are more important in achievement of the student or family factors. The findings suggest school as more influential in generating learning differences. Large class sizes and poor school conditions are linked with underachievement (Stipek & Miles, 2008).

School setting might be more problematic than the students themselves (Pirozzo, 1982). Poor maintenance of school's physical environment leads to problematic behavior in students while neat, clean, and attractive classrooms; hallways and other areas in school convey message of students' worth to them (Kumar, O'Malley, & Johnston, 2008). Role of schools in students' achievement was focus of studies by the end of 20th century, which brought forward the issue of effective schooling and role of teaching and learning in underachievement. Certain features of schools are directly related with the raised achievement of its students, such as management style. These schools adapt the management style according to the general socioeconomic status of area (Harris, 1996).

Within the significant context of underachievement there is, however, lack of consensus on any one method of assessment and researchers are still working on alternative methods of assessing the underachievers and high achievers (Cheung & Rudowicz, 2003; Rimm, 2008). With reference to Pakistani schools lack of research in context of underachievement does not even provide the true data on under achievements. Education sector in Pakistan needs special

attention and that calls for extensive research that can provide base for educational reforms. The purpose of this study is to assess underachievement in Pakistani schools. As reported earlier that characteristics of school make difference, the present study focus on three types of schools that is Federal rural schools, Federal Urban schools, and Garrison schools from Cantonment areas. Basically, the difference exists in term of their physical and social characteristics (Reynolds et al., 1980; Rutter et al., 1979). As no empirical evidence exist in the Pakistani context to establish the notion that physical and psychological environmental differences impact the performance of students, the current study has focused on school types which are, generally, considered different in their system and facilities. The present study specifically aims to compare underachievers with high achievers in the context of schools classified on the basis of gender and area.

Operational Definition of Underachiever and High Achiever

Underachievement is inability of capable children to perform in school (Rimm, 2008). It is measured discrepancy between intelligence test scores and achievement scores in school (Smith, 2003). In the present study, discrepancy between Standard Progressive Matrices (SPM) scores and Secondary School Certificate-Part I (SSC-I) scores was measured in terms of percentile ranks. Both SPM and SSC-I scores were converted into percentile ranks. Students securing at least 10th percentile less than SSC-I marks than their SPM scores were considered as underachievers. On the other hand, students ranked on 60th percentile or above on both SPM and SSC-I, without discrepancies, were considered as high achievers.

Method

Participants

Sixteen schools were conveniently selected from the list of Federal Board of Intermediate and Secondary Education (FBISE). The participants ($N = 1139$; 48.9% boys, 51.1% girls) with Mean age = 15.67 years were selected from rural, urban and cantonment/garrison areas of three cities of that is Rawalpindi, Islamabad, Kahuta, and Wah Cantt. Sample included one boys' urban school, one boys' residential school, two girls' urban school, one boys' and one girls'

schools each from two Cantonment and Garrison areas; one boys' and one girls' school each from four rural areas. The schools served as clusters from which sample of 1276 students were selected for assessment of intelligence test. The students who were presently studying in class 10th and had taken SSC-I examination under FBISE were included as sample.

Measures

Raven's Standard Progressive Matrices. It was used as measure of intelligence. Scores on SPM (Raven, 1983) were compared with Standardized Achievement Scores. The SPM is part of a series of three tests (Raven's Progressive Matrices) for persons of varying ages and abilities. The SPM has been considered an "average" level test for the general population. The SPM can be administered in group or individual setting that assesses intelligence in children and adults through abstract reasoning tasks presented in nonverbal format. The SPM consisted of 60 problems (five sets of 12 problems), all of which involve completing a pattern or figure with a part missing, and choosing the correct missing piece from six alternatives. Patterns have been arranged in order of increasing difficulty. The test can be given to nonEnglish speakers. There is no time restriction for the test but generally takes 15-45 minutes (Raven, 1983). Previous researches on underachievement (Cheung & Rudowicz, 2003) have also used SPM to measure intelligence of students.

Achievement score. Federal Board of Intermediate and Secondary Education (FBISE) organize, regulate, and control Intermediate and Secondary education. The affiliated institutions are located all over Pakistan as well as overseas. The jurisdiction of FBISE includes Islamabad Capital Territory, Cantonments, and Garrisons in Pakistan, Federally Administered Northern Areas, and overseas. As the examinations conducted under FBISE are given at the same time across Pakistan and overseas, and the marking of papers is centralized, therefore, the results can be used as scores of achievement of the students.

SSC is conducted in two parts; SSC-I and SSC-II. SSC-I is taken at 9 years of schooling while SSC-II is taken at 10 years of schooling, which is also the last year at school. SSC is termed as the foundation of academic achievement of a student, which lead to college and university degrees (FBISE, 2012). SSC-I scores of the students are taken as measure of achievement at secondary school.

Procedure

Sixteen Secondary Schools of Islamabad, Wah, and Kahuta were conveniently selected and approached for permission to conduct study. For government schools, Federal Directorate of Education had been approached. Permission from Federal Directorate of Education was taken for conducting research in the schools. Principals of the selected schools were briefed about the research and requested for the valued time of their students and teachers. Students were selected through cluster sampling for the administration of SPM. Discrepancies between achievement scores in SSC-I and intelligence scores were used to identify high and underachievers. The cut-off score method for measuring discrepancy between intelligence and achievement is based on study conducted by Lau and Chan (2001). Percentiles were calculated for both SPM scores and SSC-I scores. Students lying on 60th percentile and above on SPM were selected for further study as they were termed as high achiever. Students scoring equivalent or higher SSC-I scores were grouped as achievers, while students showing at least 10 point discrepancy on the percentile rank of SSC-I scores were grouped as underachievers.

Results

Percentile scores were computed to identify high and low achievers. Moreover, one way ANOVA was tabulated to determine differences across locality of school and gender.

On the basis of percentile scores underachievers and high achievers, group of students were identified. Initially, 1276 students were approached for SPM administration, among these SSC-I results of 1139 students were available from FBISE website. Among these 1139 students, 426 students (37% including 45.3% boys and 54.7% girls) were identified as high ability students (i.e., achieving 60th percentile or more on SPM); 352 (30.8%) selected students responded which made final sample of 213(18.7%) underachievers and 139 (12.1%) high achievers.

As shown in Table 1, schools vary in their underachiever and high achiever distribution. No underachiever is found in boys residential and girls' Cantonment and Garrison School 1; while, on the other hand, no high achiever is found in a girls' urban school, boys' urban school, and boys' Cantonment and Garrison school. Other

schools also have varying degree of underachievers and high achievers.

Table 1

Frequencies and Percentage of Prevalence of Underachievers and High Achievers in Different Schools (N=352)

School Areas	Full Sample		Underachievers		High Achievers	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Boys						
Rural 1	5	1.4	4	1.9	1	.7
Rural 2	18	5.1	16	7.5	2	1.4
Rural 3	19	5.4	14	6.6	5	3.6
Rural 4	21	6.0	20	9.4	1	.7
Urban 1	7	2.0	7	3.3	0	0
Res.CC	22	6.3	0	0	22	15.9
Cant & Gar 1	50	14.2	20	9.4	30	21.7
Cant & Gar 2	4	1.1	4	1.9	0	0
Girls						
Rural 1	9	2.6	4	1.9	5	3.6
Rural 2	15	4.3	10	4.7	5	3.6
Rural 3	6	1.7	5	2.3	1	.7
Rural 4	55	15.6	51	23.9	4	2.9
Urban 1	5	1.4	5	2.3	0	0
Urban 2	50	14.2	35	16.4	15	10.9
Cant & Gar 1	15	4.3	0	0	15	10.9
Cant & Gar 2	51	14.5	18	8.5	33	23.2
Total Sample	352	100	213	100	139	100

Note. Res.CC = Residential Cadet College; Cant & Gar = Cantonment & Garrison

Table 2 shows the results of the analysis of variance. ANOVA is applied to see the statistically significant difference between the different schools according to area, gender, and academic difference of the students. ANOVA is based on comparison along mean and standard deviations to test the difference of locality of schools on academic difference. Significant difference of locality of schools on academic differences are found with $F(1, 352) = 23.84, p < .001$.

Therefore, post hoc analysis using Bonferroni correction is carried out to ascertain differences among groups. There is significant academic difference in residential boys' urban school than Cantonment and Garrison boys' urban school.

Table 2

ANOVA along Locality of School and Gender for Achievement Difference (N= 352)

Groups	M	SD	F	i-j	D (i-j)	SE	95% CI	
							LL	UL
			23.84					
Urban-Boys (n = 17)	47.14	25.47		> 1	26.53	10.20	6.45	46.59
				> 2	33.22	10.22	13.13	53.31
				> 3	52.90	10.11	33.02	72.78
				> 4	56.23	11.03	34.53	77.94
Urban-Girls (n = 55)	20.62	18.80		< 5	-16.14	4.69	-25.37	-6.91
				> 3	26.38***	4.64	17.24	35.51
				> 4	29.71	6.42	17.09	42.33
Rural-Boys (n = 70)	27.76	25.78		> 3	42.52***	4.48	33.71	51.33
				> 2	22.84	4.72	13.56	32.11
				> 4	45.85	6.29	33.47	58.24
Rural-Girls (n = 92)	28.68	25.26		> 3	34.44***	4.17	26.23	42.65
				> 2	14.76	4.43	6.05	23.46
				> 4	37.77	6.08	25.81	49.74
C&G-Boys (n = 118)	15.90	13.90		> 3	19.68	4.67	10.51	28.86
				> 4	23.02	6.43	10.37	35.67

Note. 1 = Urban-Girls; 2 = Cantonment & Garrison-Boys; 3 = Cantonment & Garrison-Girls; 4 = Residential Boys; 5 = Rural-Boys; C&G = Cantonment & Garrison

*** $p < .001$.

There is a significant difference in academic difference of students; while, girls urban schools have significant higher score as compared to Cantonment and Garrison and residential rural schools. Furthermore, there is a nonsignificant result regarding Cantonment and Garrison girls school. So, it can be inferred that the values in the Table 2 manifest significant difference between different schools and achievement difference of the students. Table 2 also shows mean differences between the schools on achievement disparity.

Figure 1 shows that the highest achievement difference mean score are of students' of boys' urban schools where underachievement is most prevalent, while lowest achievement-difference mean score are of the students from residential cadet college. Girls' rural schools have

significant higher mean achievement difference score as compared to Cantonment and Garrison as well as residential schools.

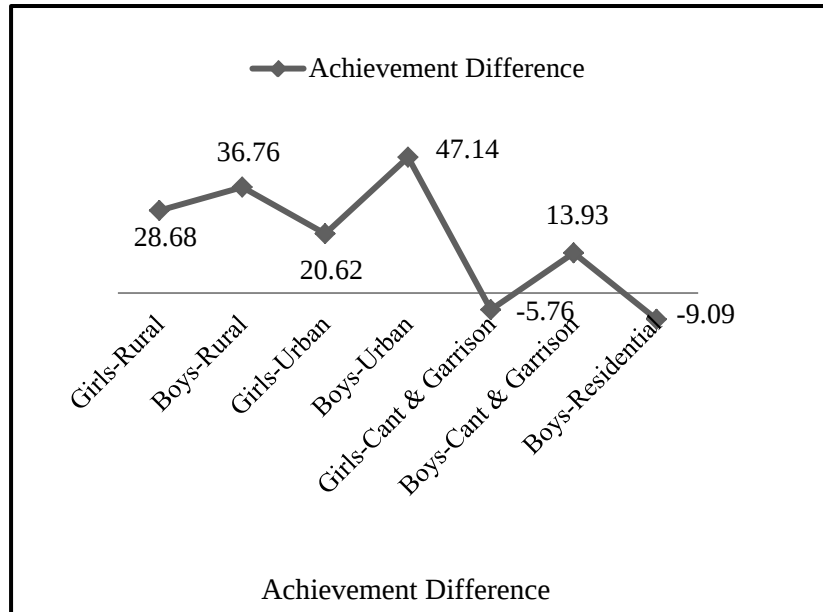


Figure 1. Comparison of achievement differences as per gender and locality of school.

Figure 1 also showed that boys' rural schools have significant higher achievement difference mean score compared to Girls' urban, Cantonment and Garrison, and Residential school. Girls' urban school has significantly lesser mean achievement difference score as compared to boys' urban and rural schools, but higher means achievement difference score as compared to girls' Cantonment and Garrison and residential schools.

Girls' Cantonment and Garrison schools has significantly lower mean achievement difference score as compared to all schools except residential school while boys' Cantonment and Garrison school has significant higher mean achievement score compared to girls' Cantonment and Garrison school and residential school, but lesser mean score as compared to girls' and boys' rural and boys' urban schools. Though, it is a descriptive picture of differences among schools but the differences are in line with previous studies which highlighted that school play significant role in determining differences across school settings.

Discussion

Underachievement has emerged as an area of marked interest among researchers due to its detrimental effects on students' later lives. In Pakistan, education sector is area of concern especially at school level. This further increases the importance of exploring educational problems like underachievement. For the assessment of underachievement, secondary schools from rural, urban, and Cantonment and Garrison areas were selected. The schools were affiliated with FBISE. In the present study, urban and rural areas of Islamabad Capital Territory (City, Sihala, Nilore, Bhara Kaho, and Tarnol) and two Cantonment and Garrison areas (Wah and Kahuta), were included.

Intelligence test was applied on 1276 students; 1139 students were selected based on valid intelligence test scores and achievement scores. Out of total, 213 (18.7%) students were identified as underachievers. Previous researches have different but nearby number to describe prevalence of underachievement that ranges from 16% to 26% (McCall et al., 2000). Results show significant difference among various schools not only in terms of frequencies of underachievers but also achievement difference scores which signifies the level of underachievement. Looking at the differences, all the rural schools, that is boys and girls, have higher frequency of underachievers as compared to high achievers. There is significant mean difference in the measure of underachievement among rural girls' schools as compared to Cantonment and Garrison and residential schools, but urban schools are not significantly better than girls' rural schools. Similarly, boys' rural schools are no worse than boys' urban schools or girls' rural schools. Residential school and a girls' Cantonment and Garrison school show best result as no underachiever was found in these schools. All the high ability students were able to achieve up to their potential.

The differences in underachievement among different schools can be explained on the basis of schools themselves in terms of area they are situated, attitude of school administration and staff, physical environment, and criteria of admission of students used by students. All the schools of rural and urban areas and boys' Cantonment and Garrison school 2 are completely government schools with the policy of admitting all children of government employ a very minimal or no fee, while nongovernment persons can also admit their children with minimal fee. Admission tests, if any, does not serve to refuse a child on the basis of not clearing the test. Most of children belong to poor and uneducated families. They are, thus, disadvantaged despite their

high ability. Students from rural areas usually belong to farmers' families; while, in urban areas, families living in slums or low income areas send their children to government schools. The findings are supported by previous studies (Kumar et al., 2008).

On the other hand, boy's Cantonment and Garrison school 1 and girls' Cantonment and Garrison school 2 shows higher frequency of high achievers as compared to underachievers. These schools are located in a residential setting under an organization where all the residents are employees of the organization and the residential setting is self-fulfilling with schools, hospital, shopping centers, community centers, parks, and sport complex within it. The residents are, thus, at an advantage of enjoying all the basic facilities with their families. The schools have the policy of admitting all the children of the employees. However, they also conduct admission tests to place students according to their ability rather than chronological age. The performance of schools is also continuously monitored by the organization's administration, helping the faculty to improve their and their students' performance. The findings of present study are also in line with the study (Preckel et al., 2006).

Last grouping of schools including boys' residential and girls' Cantonment and Garrison school can be classified as private schools with high fee structure and strict criteria for admissions. The administration of these schools is also highly organized and strict in terms of maintaining the performance of students. A strict schedule of studies and extracurricular activities is formed and it is mandatory for the students to follow that. Any student failing to perform up to mark can be struck off the school while teachers are also under continuous scrutiny which asks for extra efforts to maintain the results. The administration is also highly responsive to any act or suggestion that can serve to improve school's performance. The findings are also consistent with previous studies (e.g., Harris, 1996; Preckel et al., 2006; Reynolds et al., 1980). Keeping in view the education system of Pakistan, present study has highlighted the differences based on school characteristics that may influence the achievement of students. The significant differences shed light on the importance to improve the school environment.

Limitations and Suggestions

Following are some of the limitations of present study and suggestions for future researches in this area. Major proportion of the sample is taken from Federal Government schools of four cities.

Excluding other areas and private schools may limit the generalization of the results. As the problem of underachievement is too unique to each underachiever, quantitative research only, provided general identification with major contributors. The study did not address detailed assessment and unique variables for the underachievers. Extending the study to other areas and private schools can help better generalize the findings. The study should be carried out with qualitative approach and a number of different methods addressing school and family dynamics in detail should be used to better identify the causes and understand the phenomena of underachievement.

Implications and Conclusion

Underachievement is a problem that is informally identified by teachers and parents but is not considered as something to be addressed. Proper identification and assessment of the problem help in establishing the importance and concern for its improvement. The study is beneficial for parents, teachers as well as government agencies to identify the causes and work for the prevention.

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