WHICH SOCIAL SKILLS PREDICT ACADEMIC PERFORMANCE OF ELEMENTARY SCHOOL STUDENTS

By

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ABSTRACT

The study explored various aspects of students' social skills in an attempt to identify specific aspect that has significance in predicting their academic performance and examined the longitudinal relationship of these social skills with academic performance. The study used two models that applied advanced statistical tools to a nationally representative database of the U.S., the Early Childhood Longitudinal Study. In the first model which employed the discriminant analysis, the authors successfully classified overall performance levels of fifth graders based on their five subscales of social skills, identifying approaches to learning as the most important skill among the five. In the second model which used the profile analysis, the significant longitudinal relationship between social skills and academic achievement from kindergarten to fifth grade was confirmed; students of different achievement levels showed significantly different developmental trajectories of social skills over the six years.

Keywords: Social Skills, Academic Performance, Approaches to Learning, Longitudinal Analysis, Discriminant Analysis.

INTRODUCTION

School is an important social context for students in which social expectations and norms are established; this permits students to engage in classroom activities by self-regulating and interacting harmoniously with both peers and teachers (Belsky, Booth-LaForce, Bradley, Campbell, et al., 2006). For this reason, social skills are considered to be important skills that students learn through education along with academic skills. Conversely, it is also important for schools to promote the development of students' social and emotional learning (Zins, Bloodworth, Weissberg, & Walberg, 2006).

Further, students' social skills affect their academic performance both directly and indirectly. Emotional control enables them to focus their attention and to engage in class activities by interacting positively with peers and teachers (Lopes & Salovey, 2006). Several researchers (e.g., DiPerna, Volpe, & Elliott, 2001; Malecki & Elliott, 2002; McClelland & Morrison, 2003; Wentzel, 1991, 1993; Yen, Konold, & McDermott, 2004) have reported that students' social behaviors significantly influence their academic outcomes.

Despite the research evidence that supports the impact of students' social skills on their academic performance, the positive effect of prosocial behavior on students' academic achievement is not well accepted compared to the negative effect of antisocial behavior on achievement (Elliott, Malecki, & Demaray, 2001). Given the limited time and resources of schools, and the imposed accountability of the No Child Left Behind (NCLB) Act of 2002, stronger empirical evidence linking improved social skills to gains in academic performance is demanded for schools to accommodate social emotional learning intervention programs (Zins et al., 2006).

The research on children's social skills has been broad, encompassing various aspects of behaviors without specifying those facets (McClelland, Morrison & Holmes, 2000). The aspects of social skills dealt with in research include peer relations, behavior problems, and classroom behaviors and they were studied for their relationship with school adjustment, academic failure and achievement. This broad scope of research sheds light on the need to identify the specific aspects of social skills that are directly connected to academic

performance. The purpose of this paper is to validate the relationship between social skills and the academic performance of elementary students with the goal of further identifying specific social skills that influence students' academic performance.

Not withstanding the various social domains that research has covered in relation to academic achievement, few studies have examined social skills that combine all of these facets to investigate the relative importance of these aspects. In this study, the authors used five subscales of students' social skills that were available in the dataset, the Early Childhood Longitudinal Study Kindergarten cohort (ECLS-K); they included three positive social behaviors (*Approaches to Learning, Self-control,* and *Interpersonal Skills*) and two problem behaviors (*Externalizing Problem Behavior* and *Internalizing Problem Behavior*).

They specified two models, each serving a distinct objective. The first model was the validation model which verified the significant association between the five measures of social skills and academic outcomes of fifth grade students and further identified the relative importance of the five social skills. Thus, it answers the research questions: (i) Can the achievement level of fifth-grade students be predicted reliably with their social skills?, and (ii) Which of the five subscales of social skills (*Approaches to Learning, Self-control, Interpersonal Skills, Externalizing Problem Behaviors,* and *Internalizing Problem Behaviors*) significantly contribute in predicting the achievement level of fifth-grade students? We used the data of fifth-grade students in reading, math, and science performance, and their five subscales of social skills, as this data corresponded to their performance and social skills at the end of the elementary schooling.

The second model was the longitudinal model which examined and compared the development of the five social skills at different achievement levels from kindergarten to fifth grade. It answers the additional research question: Do the development patterns of students' social skills differ by their achievement level? Despite the efforts of previous researchers to link the effects of students' social behaviors to their academic achievement, research examining the longitudinal relationships of those variables is scant. The strength of longitudinal analysis is that it provides firmer grounds for causation than does cross-sectional research in non-experimental design (Pedhazur & Schmelkin, 1991). Therefore through the two models, this study adds to the literature by seeking to identify specific social skills that educators, policymakers, and practitioners need to focus on in social emotional learning of students during their early school years for their academic and social success.

Theoretical Perspectives

In children's social learning, Vygotsky (1978) formulated a well-known theory that linked the social behaviors of children with their academic achievement. He suggested that the development of new skills and ideas occurs through social functioning with peers and adults. Vygotsky further explained that children learn by interacting with other individuals who are intellectually more advanced than they are. In addition, he argued that children complete the developmental process by internalizing what they learn from such social interactions.

Bandura (1986) also proposed an influential theory. He maintained that children's learning is acquired by their observing or listening to others and by imitating them. Bandura's observational learning theory holds that humans' cognitive skills and behaviors are modeled by observation, and that learning is obtained from the rules of that model.

The current research regarding the relationship between social behavior and school success hold that students develop cognitive and problem-solving abilities through positive interactions with peers during academic activities (Webb, 1989). Through their undesirable behavior, however, students are isolated from classroom activities and they lose opportunities for the social exchange of academic information (Wentzel, 1993).

To be successful in school, students must learn not only the content emphasized by the teacher, but also modes of acquiring academic content via the classroom discourse (Westby, 1997). The classroom discourse involves

interactions with both teachers and peers. During the process of classroom discourse, a rule or knowledge of social participation applies. That is, information sources can be relayed or withheld, and communicative rights can be determined among members (Westby, 1997). Thus, when children's social skills are effective, they are considered to be socially competent and predicted that they will be successful in school (Walker, Schwarz, Nippold, Irvin, & Noell, 1994).

Then what social skills do teachers expect their students to have in the classroom? Lane, Givner and Pierson (2003) investigated what social skills teachers consider to be important for students' classroom success. They surveyed 366 teachers from kindergarten through high schools in California. They asked the teachers to select the most important social skills to students' classroom success from the 30 items listed on the Social Skills Rating System (SSRS) which was developed by Gresham and Elliott (Lane et al., 2003). The authors reported that the teachers rated two items related to the cooperation (i.e., following directions and being attentive) and three items related to the self-control (i.e., temper controlling in dealing with peers and adults, and appropriate responding to peers' physical offense) in the SSRS instrument as significantly important for students' classroom success, regardless of the school level.

The SSRS teacher-rated social skills were also examined in the study of McClelland and Morrison (2003). These authors differentiated cooperation and self-control from other social skills and treated them together as a single higher order construct called learning-related skills. McClelland and Morrison completed a confirmatory factor analysis and noted the emergence of learning-related skills in children as early as preschool. Further, these learning-related social skills significantly predicted students' academic performance both at the beginning of kindergarten and at the end of second grade (McClelland, Morrison, & Holmes, 2000). According to the study done by Yen and colleagues (2004), these learning-related social behaviors taken together were considered as a construct that is distinguished from cognitive ability and accounted for the variance of academic achievement above and beyond students' cognitive ability between the ages of six and seventeen.

Several researchers have found a significant effect of students' social skills on academic achievement. Research conducted by Wentzel (1991 & 1993) performed a multiple regression analysis using data from 12- and 13-year-old students, and found that pro-social behaviors significantly predicted students' standardized achievement test scores after controlling for the majority of the confounding variables including students' IQ. Malecki and Elliott (2002) conducted a similar study examining the relationship between students' social skills and academic achievement in third and fourth grade students and confirmed the existence of a significant relationship between these two factors. DiPerna, Volpe, and Elliott (2000) demonstrated that students are motivated by prior achievement and interpersonal skills, and these motivated students exhibited greater academic achievement by strengthening study skills and engagement.

Given that students' social skills are associated with their academic performance, it can be posited that improving the social skills of low-achieving students can promote their achievement. Several researchers have reported the successful outcomes of training and intervention programs boosting students' social skills. McIntosh, Vaughn, and Zaragoza (1991) reviewed 22 studies evaluating the effects of such programs in order to discover important factors that contribute to students' academic success. However, they concluded that previous studies lacked adequate evidence to support the programs' beneficial effects. Schneider (1992) conducted another meta-analysis of 79 studies examining the effectiveness of social skill training and intervention programs; it was concluded that there was only a moderate short-term effect of social skill training. Subsequently, there still is a need for strong empirical evidence regarding the positive effect of improved social skills on students' academic performance (Lopes & Salovey, 2006; Zins et al., 2007).

Methods

Data Sources

This study used data contained in the Early Childhood Longitudinal Study Kindergarten Class of 1998-99 (ECLS-K). The authors used data collected during the spring semester from fifth graders for the validation model and the four waves of the spring semester of kindergarten, first, third, and fifth grade for the longitudinal model. After the selection of valid data and the deletion of the cases which have missing data on students' performance and teacher's social rating on students, data from 10038 students were included in the analyses.

The ECLS-K was designed to provide an assessment of the various developmental aspects of children in the U.S. from the onset of their formal schooling through their progress during the elementary school years. Initial data collection of the ECLS-K began in the fall of 1998. Further, the six waves of data were collected during the spring of 2003-04. The data collection method utilized a multistage probability sample design in which the primary sampling units were counties. The second-stage units were schools within the sampled counties, whereas the final stage units were the students within those schools.

Variables

The ECLS-K data contained five subscales of social skills adapted from the Social Skills Rating Scale: Elementary Scale A (SSRS) (Gresham & Elliott, 1990). The five subscales include *Approaches to Learning, Self-Control, Interpersonal Skills, Externalizing Problem Behaviors,* and *Internalizing Problem Behaviors* (Table 1). Each subscale consists of four to six items, and each item is measured on a four-point scale ranging from 1 for *never* to 4 for *very*

Social Skills	Items	Reliability (Cronbach Alpha)
Approaches to Learning (6 items)	Attentiveness	.91
	Task persistence	
	Eagerness to learn	
	Learning independence	
	Flexibility	
	Organization	
	Respecting the property rights of others	
Self-Control (4 items)	Controlling temper	.79
	Accepting peer ideas for group activities	
	Responding appropriately to pressure from peers	
	Forming and maintaining friendships	
Interpersonal Skills (5 items)	Getting along with people who are different	.88
	Comforting or helping other children	
	Expressing feelings, ideas, and opinions in positive ways	
	Showing sensitivity to the feelings of others	
	Child argues	
Externalizing Problem Behaviors (6 items)	Child fights	.89
	Child gets angry	
	Child acts impulsively	
	Child disturbs ongoing activities	
	Child talks during quiet study time	
Internalizing Problem Behaviors (4 items)	Presence of anxiety	
	Presence of loneliness	.77
	Presence of low self-esteem	
	Presence of sadness	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Early Childhood Longitudinal Study, Kindergarten Class of 199899 (ECLS-K), spring 2004.

Table 1. Survey Items for Five Subscales of Social Skills

often as presented in Table 1. These same five measures that were repeatedly collected from kindergarten to fifth grade students using the same instrument enabled longitudinal analysis. As in Table 1, there is evidence that the five measures of social skills are highly reliable, with alphas ranging from .77 to .91 (Tourangeau et al., 2006).

For the validation model, the authors categorized the academic performance of fifth grade students into three groups based on their level of achievement (i.e., high, middle, and low) in reading, math, and science performance. To compose the groups, we considered students' performance in the three subject areas to assess their overall academic level. Students with scores in the top 25% in all three subjects were assigned to the high achieving group, whereas students with scores in the bottom 25% in all three subjects were assigned to the low achieving group. Finally, students with scores in the middle 50% in all three subjects were assigned to the middle achieving group. As a result, 1408, 1969, and 1261 students were assigned to the high, middle, and low achieving groups respectively, making the group sample size as balanced as possible. They applied the full weight (C6CW0) for the validation model to the fifth grade students in order to create a nationally representative sample of the U.S. Each of the high, middle, and low achieving groups represented 13%, 18%, and 16% of the student population, comprising 47% of the fifth-grade student population. Those students who performed well in one subject but poor in other subjects were not assigned to these distinctive achievement levels, and thus excluded from the analysis. The descriptive statistics of students in each of the groups in the three subject areas is shown in Table 2.

As in Table 2, the high achieving group was comprised of more number of boys (61%) than girls (39%) while the middle and low achieving groups were comprised of almost equivalent gender ratio. The SES of each group had the same rank order with the achievement level, as the high achieving group had the highest mean SES of .60, the middle achieving group had second highest mean SES of -.05, and the low achieving group had the lowest mean SES of -.55. In race/ethnicity composition,

		Achievement Level Group			
		High	Middle	Low	All Students
Frequency	Weighted	422172	582930	505224	3178644
	(%)	(13.3%)	(18.3%)	(15.9%)	(100%)
	Unweighted	1408	1969	1261	10038
	(%)	(14.0%)	(19.6%)	(12.6%)	(100%)
SES		.60	-.05	-.55	-.02
		(.75)	(.74)	(.66)	(.80)
Gender	Girls	165028	284418	263536	1573186
	(% Within Group)	(39.1%)	(48.8%)	(52.2%)	(49.5%)
Race/Ethnicity	White	80.7%	63.5%	33.2%	
(% within the	Black	3.6%	11.3%	32.2%	
Achievement	Hispanic	8.1%	20.5%	27.9%	
Level Group)	Asian	4.1%	1.5%	.9%	
	Others	3.5%	3.2%	5.8%	
Academic Performance		167.94	140.83	102.33	138.29
		(6.39)	(8.04)	(15.63)	(24.08)
Mean	Math	138.84	116.08	78.21	112.43
(SD)		(5.44)	(7.71)	(13.28)	(22.27)
	Science	75.54	58.77	35.78	57.26
		(4.36)	(5.19)	(8.03)	(14.50)

Table 2. Descriptive Statistics for Achievement Scores of Fifth Grade Students

the percentage of whites (81% in high achieving group vs. 33% in low achieving group) was larger in the high achieving group than in the low achieving group, whereas the percentage of blacks (4% in high vs. 32% in low) and Hispanics (8% in high vs. 28% in low) was larger in the low achieving group than in the high achieving group.

For the longitudinal model, the researchers used the teacher ratings on students' five subscales of social skills at each of the four points in time of spring semester of kindergarten, first, third and fifth (1998 -2004) using the same instruments. They employed a longitudinal panel weight (C2_6FC0) which encompassed the four waves of data. This allowed for the representation of the full student population (generalizability) for the longitudinal model; however, the study is still limited in terms of generalization from a global perspective, since the analyses are based on the data collected in the U.S.

Analysis

Discriminant analysis was the first statistical analysis the authors performed. Using the five subscales of social skills, they investigated whether students' scores on these five measures predicted their academic achievement levels and group membership (i.e., high, middle, or low

achievement). In addition, discriminant analysis informed the dimension(s) that groups differ and their relative importance through the loadings of each predictor on the discriminant function(s). Since the discriminant function is the combination of predictors that classify groups, the magnitude of correlations between the predictors and the discriminant functions reflects their relative importance in separating the groups (Tabachnick & Fidell, 2007).

In the second analysis, they performed the profile analysis using a generalized linear model (GLM) to compare the development of the five measures of social skills over the six years among the students in the three achievement levels. By examining the developmental patterns of the five subscales of social skills from kindergarten through fifth grade, one could understand the relationship between each measure of social skills and academic achievement over time. Further, the profile analysis enabled us to visually confirm and to compare the different profiles of each subscale of social skills among the three achievement groups over the years.

Results

Preliminary Analysis

Authors first calculated the descriptive statistics of the students' performance for the three achieving groups as shown in Table 2. They also calculated the correlations among the average achievement scores of students in each group and the five subscales of social skills using fifth grade data as shown in Table 3.

Since the groups were formed based on students' performance in the three subjects of reading, math, and science at fifth grade, the high achieving group showed a strong positive correlation to all three subjects of reading (r=.48), math (r=.46) and science (r=.49); the low achieving group displayed a strong negative correlation to the three subjects of reading (r=-.65), math (r=-.67), and science (r=-.64); and the middle achievement group showed a relatively low correlation to the three subjects of reading (r=.05), math (r=.08) and science (r=.05).

Among the five measures of social skills, *Approaches to Learning* had the strongest positive correlation with the three subjects of reading (r=.37), math (r=.35) and science (r=.28). *Self-Control* and *Interpersonal Skills* had a moderately strong positive correlation with all three subjects (r ranging from .18 to .24). *Externalizing Problem Behaviors* and *Internalizing Problem Behaviors* were both negatively correlated (r ranging from -.16 to -.24) with all three subjects with a similar magnitude. That is, students with higher scores on *Approaches to Learning, Self-Control*, and *Inter-personal Skills* performed better in school, whereas students with higher scores on *Externalizing* and *Internalizing Problem Behaviors* performed worse in reading, math, and science. Among the three subjects, reading was most strongly correlated with all five measures of social skills, whereas science had the weakest correlation. This suggests that reading performance was more strongly associated with social skills than math or science performance.

	1	2	3	4	5	6	7	8	9	10
1. Reading										
2. Math	.76*									
3. Sience	.77*	.76*								
4. High Achieving	.48*	.46*	.49*							
5. Middle Achieving	.05*	.08*	.05*	.19*						
6. Low achieving	-.65*	-.67*	-.64*	-.17*	-.21*					
7. Approaches To learning	.37*	.35*	.28*	.21*	-.02*	-.24*				
8. Self control	.23*	.21*	.19*	.11*	-.01*	-.19*	.68*			
9. Interpersonal Skills	.24*	.22*	.18*	.13*	-.01*	-.17*	.72*	.81*		
10. Externalizing Problem	-.24*	-.21*	-.20*	-.12*	.01*	.17*	-.60*	-.72*	-.65*	
11. Internalizing Problem	-.21*	-.22*	-.16*	-.11*	-.01*	.16*	-.41*	-.33*	-.39*	.30*

*P<.01

Table 3. Correlation between Social Skills and Academic Performance of Fifth Grade Students

Validation Model with Discriminant Analysis

The discriminant analysis results produced two significant functions successfully classifying students into three achievement level groups. With the two functions, 49.9% of the total students in the original achievement groups were correctly classified. This indicates that students' social skill levels significantly predict group membership. Specifically, high achievers had higher scores on *Approaches to Learning*, *Interpersonal Skills* and *Self-*

Control, and lower scores in *Externalizing Problem Behaviors* and *Internalizing Problem Behaviors*. The opposite was true for low achievers. In addition, *Approaches to Learning* was shown to be the most important skills among the five subscales of social skills, because it had the strongest correlation with the first discriminant function. Table 4 presents the correlation coefficients of the five social skills with the discrimination function in the order of the magnitude: *Approaches to Learning* had 0.94; *Externalizing Problem Behaviors*, -0.58; *Interpersonal Skills*, 0.57; *Self-control*, 0.56; and *Internalizing Problem Behaviors*, -0.57.

As shown in the graphical presentation of the discriminant functions in Figure 1, the three achievement level groups were distinguished in terms of the first function. That is, the first function accounted for 18% of the total relationship between students' social skills and achievement level (squared canonical correlation R^2 = .18). Specifically, the high achievement group had the highest function value, whereas the low achievement group had the lowest function value. The three groups were not clearly distinguished in terms of the second function because the second function accounted for virtually 0% of the relationship between the predictors and group membership (squared canonical correlation R^2 = .00). Thus, the relationship that the second function produced between the predictors and the groups was excluded from the interpretation. In addition, the authors presented the descriptive statistics of the five measures of social skills for the three achieving groups with box plots (Figure 2) to facilitate the comparison of social skills among the groups.

	Function 1		
Approaches to Learning	.94*		
Externalizing Problem Behaviors	-.58*		
Interpersonal Skills	.57*		
Self-control	.56*		
Internalizing Problem Behaviors	-.57*		
Eigen Value	.22		
Cannonical Correlation	.43		
Squared Cannonical Correlation	.18		
	χ^2	*Df*	*P-value*
Function 1 and Function 2 combined	267496.8	10	.000
Function 2	3610.9	4	.000

* indicates significant level at 0.05; Largest absolute correlation

Table 4. Results of Discriminant Analysis of the First Function

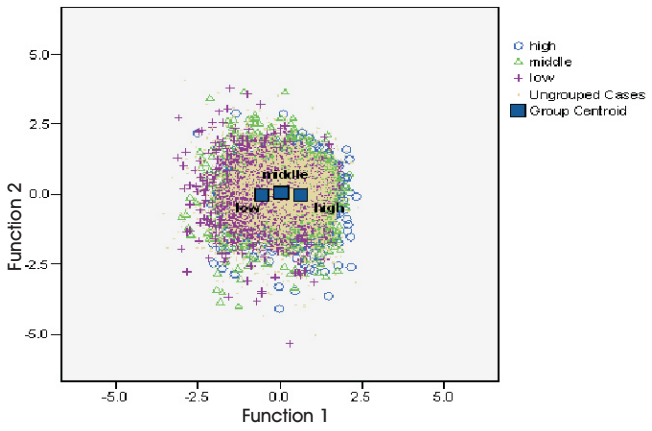


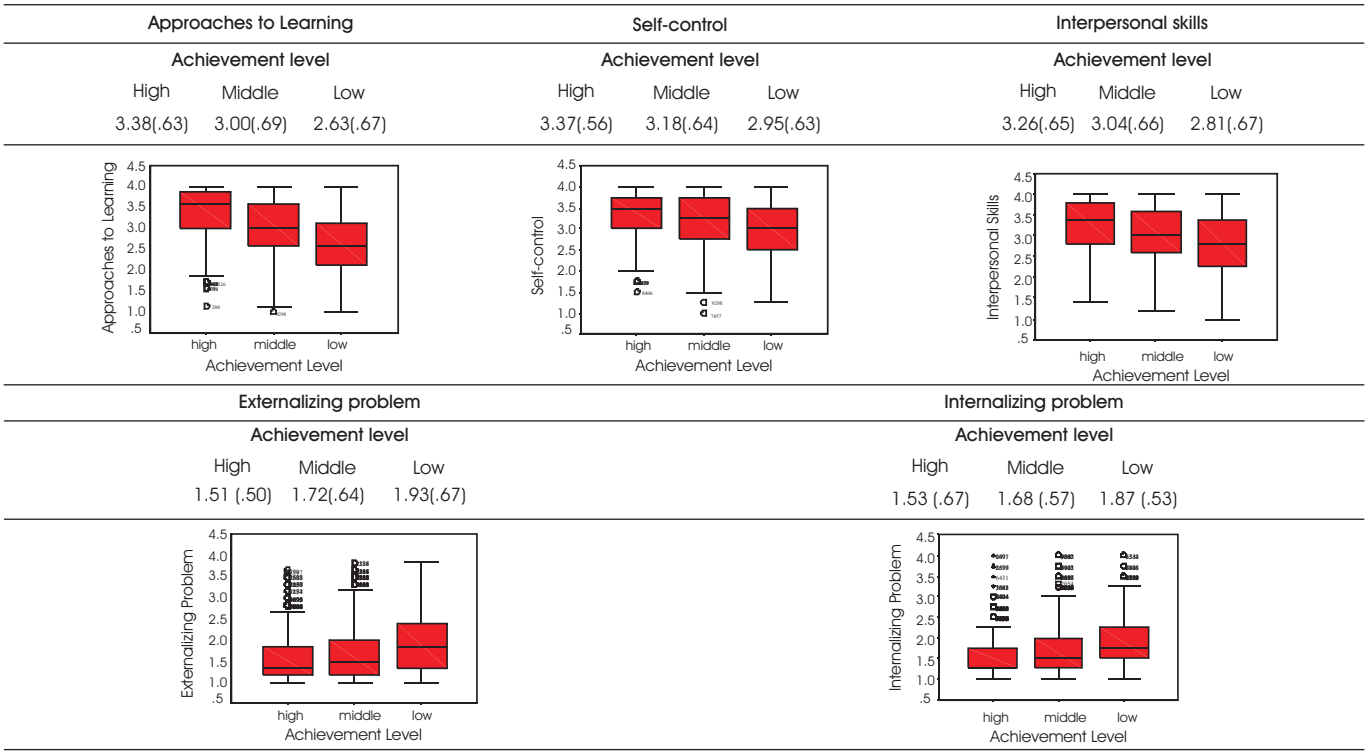
Figure 1. Canonical Discriminant Functions

Longitudinal Model with Profile Analysis of General Linear Model

The profile analysis using general linear model (GLM) was employed to identify and to understand the changes in social skills among the students in the three achievement level groups during their six school years from kindergarten to fifth grade. The use of GLM allowed us to compare the different trajectories of the three achievement groups with regard to five social skills that were verified to be reliable constructs in determining students' achievement levels through our validation model.

As shown in the results of between-subject effects in Table 3, there was a significant group difference in *Approaches to Learning* ($F = 275501.6$, $p < .01$), *Self-Control* ($F = 73637.8$, $p < .01$), *Interpersonal Skills* ($F = 90012.5$, $p < .01$), *Externalizing Problem Behaviors* ($F = 53962.5$, $p < .01$), and *Internalizing Problem Behaviors* ($F = 74957.9$, $p < .01$). The effect sizes measured by the partial η^2 were .34 for *Approaches to Learning*, .12 for *Self-Control*, .15 for *Interpersonal Skills*, .09 for *Externalizing Problem Behaviors*, and .13 for *Internalizing Problem Behaviors*. This largest effect size of *Approaches to Learning* confirms the preceding discriminant analysis in that the *Approaches to Learning* was the most important skills of the five subscales of social skills.

They also used the profile analysis to test the changes in students' social skills and differences in their developmental patterns among the three groups. The



( ) indicates Standard Deviation

Figure 2. Descriptive statistics and Box Plots of Social Skills for Three Achievement Groups

results showed that all five measures of social skills changed significantly over time. Further, the developmental patterns of students' social skills differed depending on group membership as shown in Table 5. Specifically, (Table 5) the significant *Approaches to Learning* ($F = 8553.4$, $p < .01$), *Self-Control* ($F = 279.0$, $p < .01$), *Interpersonal Skills* ($F = 6536.2$, $p < .01$), *Externalizing Problem Behaviors* ($F = 13043.9$, $p < .01$), and *Internalizing Problem Behaviors* ($F = 18591.5$, $p < .01$) in multivariate tests indicated that significant changes occurred in all five measures of social skills over the six years from kindergarten to fifth grade. In addition, the interaction effect between social skills and group membership indicated significantly different change patterns among the three groups in *Approaches to Learning* ($F = 6245.5$, $p < .01$), *Self-Control* ($F = 1290.2$, $p < .01$), *Interpersonal Skills* ($F = 2901.5$, $p < .01$), *Externalizing Problem Behaviors* ($F = 922.4$, $p < .01$), and *Internalizing Problem Behaviors* ($F = 3793.7$, $p < .01$).

The profiles of the five measures of social skills in Figure 3 verified that the three pro-social behaviors (*Approaches to Learning, Self-control,* and *Interpersonal Skills*) were consistently higher, and the two problem behaviors (*Externalizing Problem Behaviors* and *Internalizing Problem Behaviors*) were consistently lower for the high achievers than for the low achievers during the first six school years from kindergarten to fifth grade, indicating the significant longitudinal relationship between students' social skills and academic achievement. The profiles also presented that the largest differences among the three

		Approach to Learning		Self-control		Interpersonal skills		Externalizing problem		Internalizing problem	
		F	*p*	*F*	*p*	*F*	*p*	*F*	*p*	*F*	*p*
Multivariate tests	Social skills	8553.4	.000	279.0	.000	6536.2	.000	13943.9	.000	18591.5	.000
	Social skills x Group	6245.5	.000	1290.2	.000	2901.5	.000	922.4	.000	3793.7	.000
Between-Subject effects	Groups	275501.6	.000	73637.8	.000	90012.5	.000	53962.5	.000	74957.9	.000

Table 5. Results of General Linear Model on Five Subscales of Social Skills for the Three Achieving Groups

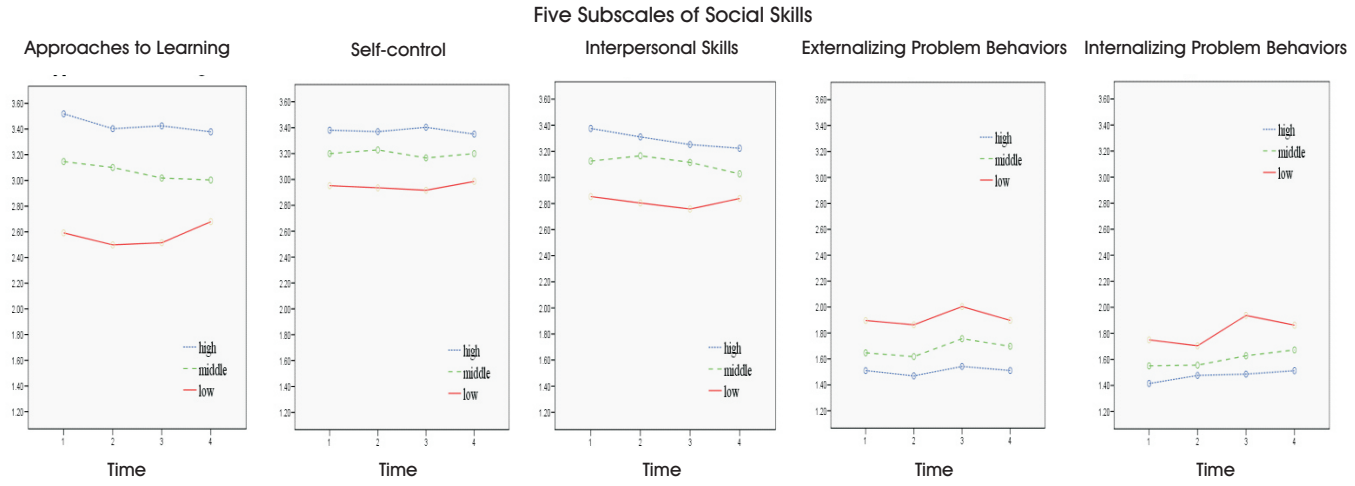


Figure 3. Profile Comparisons of Three Achievement Groups in Five Subscales of Social Skills

achievement level groups was in *Approaches to Learning*, confirming the results of the above discriminant analysis that rendered *Approaches to Learning* to be the most important skills among the five measures of social skills. In addition, the profiles also displayed more fluctuation over the years in *Internalizing problem behaviors* for students in the low achievement group than in the middle or high achievement groups.

Discussion and Recommendation

The relationship between students' social skills and academic achievement was confirmed in this study. Five subscales of social skills (*Approaches to Learning, Self-Control, Interpersonal Skills, Externalizing Problem Behaviors*, and *Internalizing Problem Behaviors*) were collectively successful in classifying fifth-grade students into three achievement level groups in terms of their overall performance in three subject areas (reading, math and science). *Approaches to Learning* was shown to be the most important skills among the five in separating students into three levels. In addition, different developmental patterns of the five subscales of social skills from kindergarten to fifth grade among the three achievement groups were verified through the profile analysis of GLM. The profiles indicated that high achievers scored significantly higher on measures of three positive social skills (*Approaches to Learning, Self-Control,* and *Interpersonal Skills*) and significantly lower on measures of two problem behaviors (*Externalizing Problem Behaviors* and *Internalizing Problem Behaviors*) consistently from kindergarten to fifth grade, while the low achievers did the opposite. Further, the profiles indicated that the students in the three achievement groups showed the largest gap in *Approaches to Learning*, and the students in the low achieving group displayed more fluctuation in problem behaviors than those in other groups.

These findings highlight the importance of *Approaches to Learning* among various social skills. In this analysis, the *Approaches to Learning* of students was the most significant factor in discriminating among the high, middle, and low achievers. This confirms the study of McClelland et al. (2000) which distinguished *Approaches to Learning* from other social skills as a significant predictor for students' current and future academic performance, and the study of Lane et al. (2003) which demonstrated students' *Approaches to Learning* skill as the most important skill in classroom from teachers' perspectives. Based on these findings, the authors tentatively recommend that schools make an effort to improve students' skills in this area. As Pelco and Reed-Victor (2007) addressed in their study, these learning-related social skills need to be instructed directly as part of curriculum in elementary schools, because inappropriate behaviors related to *Approaches to Learning* are amenable to change with time and effort, and they are sustainable once improved. The skills enumerated by Pelco and Reed-Victor (2007) for instruction included

specific classroom behaviors such as "how to talk inside the classroom" and "how to wait one's turn" for lower grade students, and "how to take notes" and "how to organize a notebook and backpack" for upper-grade students.

The National Education Goals Panel (NEGP) reported that *Approaches to Learning* was the most important factor among the school readiness indicators for kindergarteners. Further, Fantuzzo, Perry, and McDermott (2004) explained that *Approaches to Learning* is the ability to engage in learning activities. Posner and Rothbart (2000) emphasized that children's ability to regulate attention develops from the age of three years to early school years. Despite the importance of this factor as an indicator of school readiness which emerges at early age, *Approaches to Learning* has been neglected in the research (Kagan, Moore, & Bredikamp, 1995). Future research utilizing an experimental design is warranted to determine whether improved academic performance can be attributed to improvements in students' scores on *Approaches to Learning*.

In addition, the large fluctuation over the years in the development of *Internalizing problem behaviors* for the low achievement students underscores the need for a relevant intervention and support for this group of students. *Internalizing Problem Behaviors* are also interconnected with *Approaches to Learning* in such a way that the anxiety or depression resulting from *Internalizing Problems* interferes with students' attentiveness (Rapport, Denney, Chung, & Hustace, 2001). Belsky et al. (2006) reported that lower elementary students who were in highly structured classrooms with insufficient emotional support exhibited more *Internalizing Problem Behaviors*. Further, the need for a more supportive role by teachers towards younger students with low performance and low motivation was demonstrated in the study of Patrick, Mantzicopoulos, Samarapungavan, and French (2008). In their study, kindergarten children with low motivation and competence in science had the lowest rate of supportive interaction with their teachers in learning-related matters. Given that support for social and emotional skills is necessary for the development of children's cognitive and learning abilities (McCombs, 2006), it is important to identify students in need of such support not only for academic outcomes, but also for non-academic outcomes which can be neglected when education is centered around academic outcomes only.

This study is not without limitations. The presence of limitations defers the positing of a direct causal inference between students' social skills and academic performance. The analyses were based on data collected via survey which did not employ random assignment and consequently confound results. Despite the limitations, this study has educational significance and extends professionals' understanding of the effect of students' social skills on academic performance. First, the results validate the associative relationship between social skills and academic achievement by further specifying that *Approaches to Learning* is the most significant skill to the relationship through both cross-sectional and longitudinal analyses. Second, the analyses utilized data from a nationally representative sample of the U.S., which increases the generalizability of the study's findings.

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