

***Standardized Tests as Predictors of Academic Performance:  
Implications on the MCLS Testing Program***

Zarah May C. Buyan, Miriam College Lower School, Philippines  
Marilet C. Delgado-Anastacio, Miriam College Lower School, Philippines

The Asian Conference on Education 2021  
Official Conference Proceedings

**Abstract**

As part of its periodic testing program evaluation and to support the institutional viability of a private school in Quezon City, Philippines, the school's Guidance Center examined the predictive value of the School Readiness Test (SRT) as its admissions tool in terms of its relationship with the Grade 1 academic performance. Likewise, the study looked into the predictive value of the English and Mathematics pre-test for Grade 1 which is administered through an outsourced partner of the school. Adopting a longitudinal predictive research design, this study examined changes on the quantitative data taken from the population over time. The data was analyzed using multiple linear regression at .05 significance level. Results indicate that there is a correlation between the standardized test scores and the participants' general academic average. Furthermore, SRT and achievement tests are predictive of academic performance. Implications on the school testing program were discussed and exploring locally developed assessment tools was recommended.

Keywords: Predictive Study, Standardized Tests, Academic Performance, Testing Program, Admissions, School Assessment

**iafor**

The International Academic Forum  
[www.iafor.org](http://www.iafor.org)

## Introduction

Admissions is the first interaction between the school and potential students and their parents or guardians. During admissions period, parents or guardians find out more about the school's curriculum, programs and other offerings. In turn, the school assesses the child's readiness for its academic structure. This step helps align the expectation of stakeholders in maximizing the abilities of the student. Admissions is especially momentous for first graders as it marks facing bigger learning opportunities and challenges from their preschool experience. For the part of the school, especially private institutions, admissions is the lifeblood that sustains its programs and facilities. It is therefore crucial that entry-point evaluation balances the school's criterion for excellence and its openness to accommodating children's areas for development.

In Miriam College Lower School (MCLS), the written test is one of the integral instruments utilized during admissions. As such, the test material is subjected to periodic evaluation to ensure that it still corresponds to the evolving profile of the learners. Considering these, MCLS adopted the School Readiness Test (SRT) as its admissions test for school year 2014-2015 Grade 1 student applicants. SRT was chosen for its more updated and concise coverage of subjects and topics. Moreover, it is the same yearend assessment tool used by the Miriam College Child Study Center (MC-CSC) to evaluate their kindergarten students. It was then deemed to be potentially useful in efforts to compare and align data between the units.

Also, part of MCLS' testing program are the locally-developed standardized achievement tests outsourced through the Center for Educational Measurement (CEM), Inc.. These are administered to students from Grades 1 to 5. For Grades 1 and 2, students take the English and Mathematics tests. Grades 3 to 5 students take English, Mathematics, and Science tests. Results are presented to the community, especially to the Academic Committee, for their use in the continuous advancement of the unit's academic programs.

This study was undertaken in response to Miriam College Board of Trustees' directive to review the admissions processes to encourage more student applications. It was also a timely opportunity to utilize testing data to further support the unit's academic initiatives as well as the school's economic viability.

This research aims to examine the ability of both admissions and achievement tests in English and Mathematics to predict the students' academic performance in Grade 1. In particular, the research aims to answer the following questions:

1. Is the School Readiness Test (SRT) predictive of the MCLS Grade 1 academic performance?
2. Are the achievement tests in English and Mathematics predictive of the MCLS Grade 1 academic performance?
3. Which between the SRT and achievement tests is/are the better predictor/s of Grade 1 academic performance?

The outcome of this study will help evaluate the testing program and yield possible recommendations that could aid student admissions especially in Grade 1. Data could also be useful in helping students transition from Kindergarten to first grade and continuously support their development in MCLS.

The primary focus of this study is to assess the predictive value of the school's admissions tool in relation to the academic performance of the first graders. Generalizations provided in this

study are limited to the new students only. Other factors which may affect the participants' general averages could include age, personality, and preschool experiences. These will be part of the discussion of the study.

Many recent related literatures seem to point towards the opposite direction when it comes to administering standardized tests to early graders. In the USA, the contention seems to stem from the implementation of the *No Child Left Behind* Law which resulted to 'high stakes testing' wherein standardized tests results are used as determinants for grade retention, graduation, college admission, teacher employability and school performance, among others (Solley, 2007). Tying such consequence to an assessment tool led many to question the credibility of the test instrument as the only objective indicator of teacher effectiveness and student learning especially among young children (Marisco Institute for Early Learning and Literacy, 2010).

Christopher Tienken (2015) flagged the flawed process of school administrators to make multiple interpretations and critical decisions based on the results of one test. Instead, outcomes should be confirmed for group and individual validity by cross-referencing with other data sources, much like a three-legged stool that stands to prop up a balanced learning profile.

Concerns have also been raised on the effect of such stringent testing on young children. Fleege and colleagues (2003) observed Kindergarten students' behavior while taking a standardized test. They reported a significant increase in behaviors related to stress. These stress-related actions were notably decreased after taking the test. Assessment has also impacted Kindergarten teachers over the years. Bassok, et al (2016) found that compared to Kindergarten teachers in 1998, Kindergarten teachers in 2010 put more value on their individual students' achievement test performance in based on local, state and professional standards. They also give more importance on each student's performance compared to their peers.

There is also the issue of futility of testing young children to determine those who might be at-risk for academic difficulties. Frans and colleagues (2017) found that majority of students who were identified as "at-risk" in preschool became capable learners as they moved up to the early grades. This is similar to the results of the study of Anastacio (2017) where the later academic performance of low-scorers in the School Readiness Test for by third grade have improved. However, these findings do not diminish the value of tests in the school setting. William (2010) started his research report by saying that assessment is a key process in education. International Literacy Association (2017) recognizes the usefulness of standardized tests in assessing student achievement, comparing performance, evaluating programs and its interconnectedness to developing school policies and determining accountability. Assessment in early grades can also prove useful in identifying anchors in predicting reading abilities in later grades especially if done with the appropriate instruments. They also recommend testing at the end of kindergarten to ensure a more strongly related data to reading achievement than assessments at the beginning of kindergarten (Schatschneider et. al, 2004).

The recurring theme of these literatures points out that assessment has an important function in education. However, authorities should be very careful to consider the instrument's intended design, limitations and impact on the stakeholders. The tenet is that test scores should be helpful to the teachers, parents, and students in education (Cooley, 1991 in Haladyna, 2002). It was emphasized that with its increasing use and influence over time, the challenge is in

ensuring its logical use and valid interpretation. Moreover, one standardized test cannot determine all facets of a learning experience. Validating or alternative teacher-developed evaluation strategies are strongly recommended (ILA, 2017; Tienken, 2015; MIELL, 2010; Solley, 2007, Haladyna, 2002).

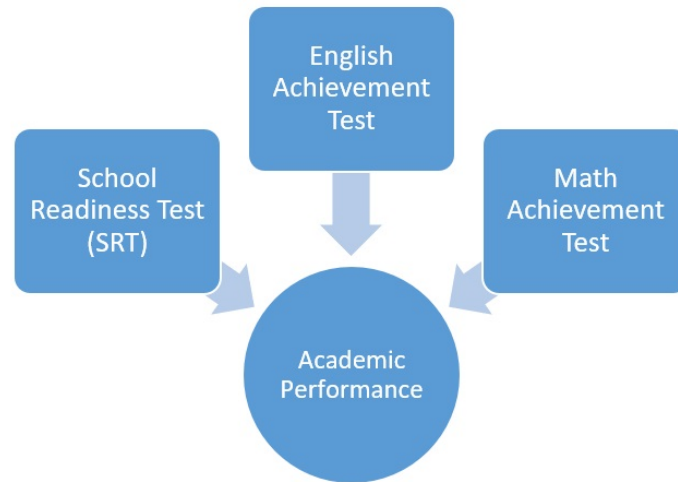


Figure 1: Conceptual Framework

Figure 1 illustrates the structure of this study with its aim to look at the ability of the school Readiness Test (SRT) and English and Math Achievement Tests in predicting the academic performance of students.

The following terms will be operationally defined as:

1. *Academic performance* – refers to the general average of the students at the end of a school year
2. *Standardized tests* – refers to the admissions (SRT) and achievement pre-tests from an outsource provider
3. *Admissions test scores* – refers to the overall SRT ratings obtained by the new student applicants
4. *Achievement test scores* – refers to the students’ percentage of correct answers in English and Mathematics
5. *Indicators* – refers to the standardized test scores as predictors of academic performance

## Design

This study adopted a longitudinal predictive research design (Johnson, 2001). It aims to determine how well the standardized tests’ scores are able to predict the academic performance of first graders for three consecutive school years. Trend study was used to examine change on the quantitative data taken from the population over time.

## Participants

A total of 319 first graders were the participants in this study. New students who have taken the School Readiness Test (SRT) as the admissions examination, and the achievement pre-tests

in Mathematics and English from SY 2015 to 2018 were the basis of the selection of participants. The formula given by Tabachnick and Fidell (2001) was taken into consideration:  $N > 50 + 8m$  (where  $m$  = number of independent variables).

## **Measures**

General averages represent the academic performance of the participants. These are computed by averaging the quarterly final grade of the Grade 1 students in all core subjects. Data was extracted through the Student Database Management System (SDMS) of the school.

Admissions examination for incoming first graders is administered by the school's psychometrician in one sitting. It assesses seven (7) individual readiness skills namely Vocabulary, Identifying Letters, Visual Discrimination, Phonemic Awareness, Comprehension & Interpretation, Mathematical Knowledge, and Developmental Spelling Ability. The SRT result is comprised of assessment classifications which serve as the basis for the overall readiness assessment of the students. The SRT obtained a .94 reliability score using the Kuder-Richardson Formula 21 which indicates a very high degree of internal consistency. Whereas, the standard error found for its total score is 4.9 raw score points (Scholastic Testing Service, Inc., 2004).

Standardized achievement tests, appropriate for the grade level, measure the acquired levels of knowledge and skills of the students in English and Mathematics. Pre-tests developed by the CEM, Inc. are administered within the first quarter of every school year. The students are required to accomplish these multiple-choice format group-test within the time limit specified by the examiner. The reliability indices of the K to 12 Achievement tests for English and Mathematics (Grade 1) range from .85 to .91. To validate, the final grades on the academic subject of the test takers are used as the external measure. Coefficients ranging from .31 to .83 indicate that the tests have concurrent validity (CEM, 2016). The achievement pre-test results are reported in Percent Correct (PC). This refers to the percentage of questions that the examinee answered correctly in each content area and cognitive skill in accordance to the learning competencies for a specific grade level prescribed by the national curriculum. The score ranges from 0 to 100 (CEM, 2016).

## **Procedure**

Primary data were accessed from and kept in the school's Guidance, Testing, and Research Center. In compliance to the Data Privacy Act of 2012, permission on the collection and utilization of data was acquired through letter to parents distributed before the administration of various guidance tests.

The selection of data corresponds to the criteria for selection of participants. Records of admissions and achievement tests results were retrieved from the student annual reports. New students in each section were identified and grouped according to school year. Statistical data analysis was employed to determine how well admissions and achievement test scores predict the academic performance of MCLS new students from SY 2015 to 2018. Relative contribution of each independent variable was identified for every school year as well. To examine whether the SRT ratings and achievement tests scores in English and Mathematics consistently predict the academic performance of the first graders, the trend for three consecutive school years was analyzed.

## Data Analysis

The ability of admissions and achievement tests scores to predict the academic performance of new students was analyzed using multiple linear regression at .05 significance level. This analysis was conducted on each set of scores per school year. Predictors were correlated with each other to eliminate multicollinearity. Tests for normality, linearity, and homoscedasticity were performed to verify the assumptions of the regression analysis. To test the hypotheses, the predictive power of the independent variables was identified, as well as its relative contribution to the academic performance. From the results, interpretations were drawn in view of the research questions posited in this study.

The results of the data analyses carried throughout the duration of the study are presented in through the following tables and figures.

## Descriptive Statistics

	SY 2015-2016			SY 2016-2017			SY 2017-2018		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
General Average	112	90.55	3.91	109	89.59	4.40	98	91.10	4.69
SRT	107	100.72	12.55	108	93.68	11.67	98	96.02	12.29
English	112	54.70	18.97	109	56.68	19.04	95	57.73	18.80
Mathematics	112	40.35	13.39	109	41.93	14.00	95	43.46	13.45

Table 1: Summary of Descriptive Statistics of the Variables

Table 1 shows the descriptive statistics of the predictors covering the participants' mean scores in the admissions and achievement tests for three consecutive school years as well as their general averages (GA). Although the number of new students decreases yearly, a trend of increase is noticeable in the mean percent-correct scores for English and Mathematics achievement pre-tests.

## Correlations

	SY 2015-2016			SY 2016-2017			SY 2017-2018		
	SRT	English	Math	SRT	English	Math	SRT	English	Math
General Average	.660*	.724*	.695*	.680*	.754*	.717*	.612*	.640*	.542*
SRT		.709*	.631*		.674*	.684*		.613*	.509*
English			.724*			.697*			.540*

\* $p < .05$

Table 2: Summary Correlation Table

The summary of the correlation coefficients is shown on Table 2. Significant relationships were found between results of admissions tests and achievement pre-tests scores in English and Mathematics across three consecutive school years. Note the very high correlations between English pre-test scores and the other independent variables in SY 2015-2016.

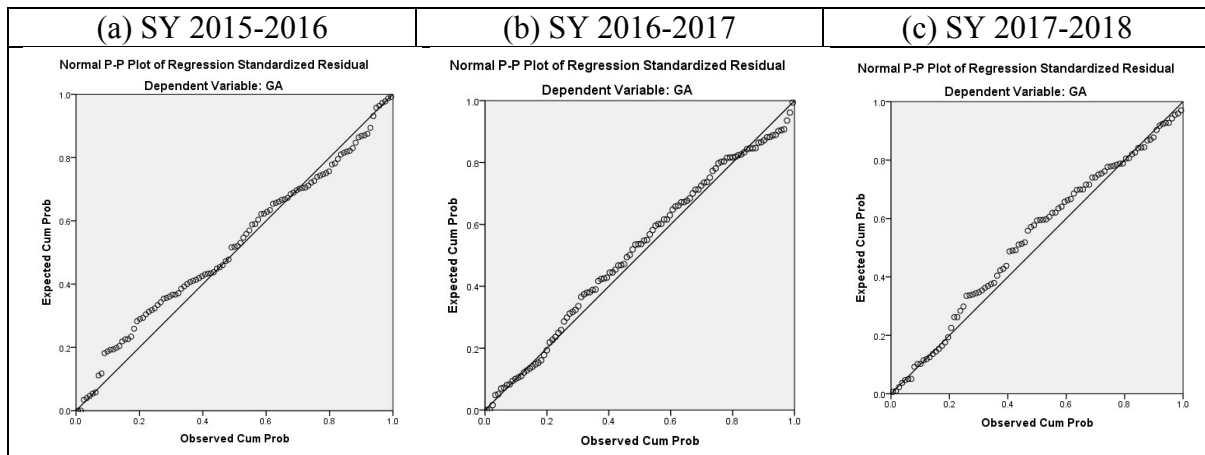


Figure 2: Normal Probability Plot of Regression Standardized Residual of General Average Which Show Normality

All data passed the tests of normality, linearity, homoscedasticity, and multicollinearity. Figure 2 shows the Normal Probability Plot of the academic performance in each school year. The reasonably straight distribution of the independent variables suggests that there are no major deviations from normality.

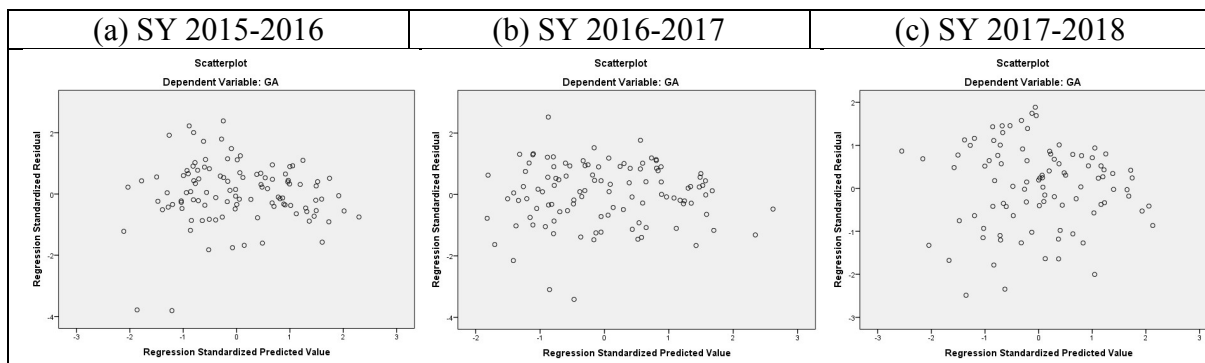


Figure 3: Scatterplot of Standardized Residuals Which Show Linearity and Homoscedasticity

Figure 3 presents the Scatterplot of the standardized residuals against predicted values per school year. Most of the scores are concentrated in the center which depicts a linear relationship between the variables. No clear pattern was evident in the distribution which implies that the data is homoscedastic as well.

To test the assumption of multicollinearity among independent variables which display too high correlations, the collinearity diagnostics were examined. The first value, Tolerance, indicates how much of the variability of the specified independent is not explained by the other independent variables in the model. The second value is the Variance inflation factor (VIF) which is the inverse of the Tolerance value. The Tolerance value of less than .10 and a VIF value of above 10 suggests the possibility of multicollinearity (Pallant, 2005). Looking into the collinearity statistics of the independent variables in SY 2015-2016, the Tolerance values of .468, .370, and .448, as well as the VIF values of 2.14, 2.7, and 2.23, respectively, indicate that there is no multicollinearity.

## Multiple Regression

Variable	SY 2015-2016		SY 2016-2017		SY 2017-2018	
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
SRT	.223*	2.471	.203*	2.391	.294*	3.066
English	.345*	3.405	.416*	4.827	.350*	3.564
Math	.305*	3.315	.288*	3.297	.203*	2.250
$F$	53.406		66.797		32.083	
<i>Adjusted R</i> <sup>2</sup>	.597		.648		.498	

\* $p < .05$

Table 3: Relationship of Admissions and Achievement Pre-test Scores to General Average

Results revealed consistent positive correlations between general average and SRT scores from SY 2015 to 2018 ( $r = .66, r = .68, r = .61$ ). Likewise, English ( $r = .72, r = .75, r = .64$ ) and Mathematics ( $r = .70, r = .72, r = .54$ ) pre-test scores are strongly correlated with the new students' general average for three school years.

Table 3 presents the results of the multiple regression with standardized regression coefficients ( $\beta$ ),  $t$  value, and adjusted  $R^2$ . The model for academic performance in SY 2015-2016 displays a significant result,  $F(3,103) = 53.406$ , adjusted  $R^2 = .60$ . Data analysis showed that SRT ratings and achievement pre-test scores in English and Mathematics can explain 60% of the variance in the general averages of MCLS new students in SY 2015-2016. Persistently, the models for academic performance in SY 2016-2017 [ $F(3,104) = 66.797$ , adjusted  $R^2 = .65$ ], and SY 2017-2018 [ $F(3,91) = 32.083$ , adjusted  $R^2 = .50$ ], are also significant. The test scores account for 65% and 50% of the variance found in the academic performance of the participants for the following two school years.

Though significant, admissions test scores seem to contribute the least in the prediction of the new students' academic performance among all indicators. Beta coefficients of SRT ratings range from .20 to .29 for three academic years. Whereas English and Mathematics beta coefficients range from .20 to .41. In SY 2015-2016, a unit increase in the SRT score will predict a .223 increase in the general average of new students. The next couple of years, every unit increase in the admissions test score suggested a .203 and .294 increase in the students' academic performance.

Looking into the relative contribution of the achievement pre-tests scores, English appears to be the most effective indicator of academic performance of MCLS new students. Its beta coefficients are .345, .416, and .350 from SY 2015-2016 to SY 2017-2018, respectively. On the other hand, a decreasing trend of beta values emerged from the annual Mathematics pre-test scores (.305, .288, .203).

## Conclusions

Standardized testing among young students in the United States is recently under fire for its observed negative impact on the test-takers well-being. 'High-stakes testing' is also criticized for its tendency to depend on a single test result to determine major administrative decisions.



Results of US government-mandated assessments likewise impacts academic systems such as student retention and teacher employability (Tienken, 2015; MIELL, 2010; Solley, 2007).

It seems clear, however, that the disapproval is not on the testing itself but rather, on the use of gathered data. There is also substantial scholastic recognition for the role of standardized testing in the educational setting. The emphasis is put on the responsible use of the instrument and the data it yields. While there is no perfect assessment tool, an appropriately matched test content and curriculum or instruction could yield relevant data for policy holders, educators and the public (Haladyna, 2002). Each assessment tool has to be considered for its intended purpose and population. While standardized tests are assumed to be valid and reliable, other sources of student data should not be discounted such as teacher observation and student portfolio because this additional information outside of the usual pen-and-paper measurement provide a view of various and complex aspects of learning.

In the Philippine setting, many established private educational institutions continue to rely on standardized tests as an assessment approach for student admissions. As a premiere school for Filipino girls, MCLS is taking this research as a step to evaluate the appropriateness of the practice given the evolving profile of learners and emerging indicators that could call for innovative and alternative methods.

In response to the research questions, data analyses indicate all tests are predictive of Grade 1 students' academic performance. However, while it is being utilized as the primary admissions tool, the School Readiness Test (SRT) is the least predictive of MCLS Grade 1 students' academic performance. Statistically, CEM English and Mathematics pre-test are more strongly correlated to the Grade 1 students' grades than SRT. This could be because first, a CEM test is developed in the Philippines—based on the prescribed curriculum of the Department of Education and validated with the local population. Secondly, CEM tests are more exhaustive, covering fifty (55) items each for English and Mathematics. Each subject allots at least 60 minutes of test time. On the other hand, the SRT has 126 items covering seven learning areas of school readiness. A student typically finishes this test in one sitting within an hour and a half.

Considering the standardized testing issues mentioned in researches, it must be noted that SRT is only one of several aspects considered during the MCLS admissions process. In short, a 'failing' mark in this test does not automatically bar a student from being accepted into the school. This implies that the unit recognizes that there are many facets of each child's being beyond the ones reflected on their test scores.

In conclusion, the use of standardized testing as part of the admissions process of MCLS remains a sensible procedure that yields practical data for its administrators. In review of the findings and related studies, this research proposes the following for the continued development its admissions procedures and the Guidance Center's testing program:

1. Development of admissions interview rubrics – Set questions that aim to draw out specific information from the student applicant such as speech and language abilities, reading, and comprehension skills, and ability to follow simple instructions.
2. Consider the possibility of developing and administering teacher-made tests to supplement the admissions test. Locally-developed tests would help assure that the items would be closely-aligned to the existing standards and curriculum of MCLS and include subject areas that are not typically covered by standardized testing (i.e. Araling Panlipunan and Filipino).

3. Continue the periodic evaluation of admissions test procedures to balance the academic benchmarks while keeping up with the evolving profile of the learners and supporting institutional viability.

The research findings will be submitted to the MCLS administration and may be presented to the community to provide information regarding the strengths and challenges of school's admission process. The authors recommend the conduct of further studies with a larger sample size, possibly including all Grade 1 students as a bigger population could show a more distinct profile of the learners.

Observing the new students' performance as they progress to higher grade levels is also helpful in possibly identifying consistent obstacles and effective interventions to their learning.

Lastly, with baseline data from first grade, a longitudinal study tracking the students' growth during their stay in the lower school unit can give varied perspectives especially when analyzed in relation to programs and interventions implemented within the same period.

## References

- Anastacio, Marilet. (2017). *School Readiness Test and Later Academic Performance of MCLS Grade 3 Students for SY 2017-2018*. Unpublished Research.
- Bassok, D., Latham, S., & Rorem, A. (2016). *Is kindergarten the new first grade?*. AERA open, 2(1), 2332858415616358.
- Center for Educational Measurement, Inc. (2016). *CEM K to 12 Achievement Tests Score Interpretation Guide*.
- Center for Educational Measurement, Inc. (2016). *CEM K to 12 Addendum*.
- Fleege, Pamela O., Charlesworth, Rosalind, Burts, Diane C. & Hart, Craig H. (1992). Stress Begins in Kindergarten: A Look at Behavior During Standardized Testing, *Journal of Research in Childhood Education*, 7:1, 20-26, DOI: 10.1080/02568549209594836
- Frans, Craig H., Post, Wendy J., Huisman, Mark, Oenema-Mostert, Ineke C. E., Keegstra, Anne L., & Minnaert, Alexander E. M. G. (2017). Early identification of children at risk for academic difficulties using standardized assessment: stability and predictive validity of preschool math and language scores, *European Early Childhood Education Research Journal*, 25:5, 698-716, DOI: 10.1080/1350293X.2017.1356524.
- Haladyna, T. M. (2002). *Essentials of standardized achievement testing: validity and accountability*. Allyn & Bacon.
- International Literacy Association. (2017). *The roles of standardized reading tests in schools [Literacy leadership brief]*. Newark, DE: Author.
- Johnson, B. (2001). Toward a new classification of nonexperimental quantitative research. *Educational Researcher*, 30(2), 3-13.
- Marisco Institute for Early Learning and Literacy, (2010). *The case against testing young children to evaluate teacher effectiveness: a position statement from Marisco Institute for Early Learning and Literacy*. University of Denver, Morgridge College of Education.
- Pallant, J. (2005). *SPSS survival manual: A step guide to data analysis using SPSS*.
- Schatschneider, C., Fletcher, J. M., Francis, D. J., Carlson, C. D., & Foorman, B. R. (2004). Kindergarten prediction of reading skills: A longitudinal comparative analysis. *Journal of Educational Psychology*, 96(2), 265.
- Scholastic Testing Service, Inc. (2004). *School Readiness Test User Manual*. Illinois 60106-1617
- Solley, Bobbie A. (2007). On Standardized Testing: An ACEI Position Paper, *Childhood Education*, 84:1, 31-37, DOI: 10.1080/00094056.2007.10522967

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics (4<sup>th</sup> edn.)*. New York: HarperCollins.

Tienken, Christopher H. (2015). Test Use and Abuse, *Kappa Delta Pi Record*, 51:4, 155-158, DOI: 10.1080/00228958.2015.1089617

Wiliam, Dylan. (2010). Standardized Testing and School Accountability, *Educational Psychologist*, 45:2, 107-122, DOI: 10.1080/00461521003703060