

Technical Report

***Teach for America Teachers' Contribution to
Student Achievement in Louisiana in Grades 4-9:
2004-2005 to 2006-2007***

George H. Noell, Ph.D.
Department of Psychology
Louisiana State University

&

Kristin A. Gansle
College of Education
Louisiana State University

October 27, 2009

Acknowledgements

This report is based upon data provided by the Division of Planning, Analysis, and Information Resources of the Louisiana Department of Education. The authors would like to thank Allen Schulenberg, Sam Pernici, Michael Collier, and David Elder (Division Director), without whom this work would not have been possible. Additional data were provided by the Louisiana Board of Regents and Teach for America.

Any errors, omissions, or misstatements contained herein are entirely the responsibility of the authors. Any conclusions proffered are the responsibility of the authors and do not reflect the views of the Louisiana Department of Education or the professionals from that organization who provided professional guidance and technical assistance.

This work was supported in part by award CT-06/07-VAA-01 from the Louisiana Board of Regents and the Carnegie Corporation of New York.

Table of Contents

Abstract	3
I. Introduction	4
II. Data Merging Process and Base HLM Model Development.....	5
Figure 1: Nesting Structure	5
Attrition in TFA Teacher Data.....	7
III. Assessment of the Contribution of TFA Teachers to Achievement	7
Figure 2: English Language Arts Results	9
Figure 3: Reading Results.....	9
Figure 4: Mathematics Results.....	10
Figure 5: Science Results.....	10
Figure 6: Social Studies Results	11
Table 1: Assessment Results across Content Areas and Comparison Groups.....	12
IV. Persistence of TFA Teachers in Teaching.....	12
Figure 7: Persistence in Teaching by Licensure 2003-2004.....	13
Figure 8: Persistence in Teaching by Licensure 2004-2005.....	14
Figure 9: Persistence in Teaching by Licensure 2005-2006.....	14
V. Summary	14
References.....	16

Abstract

***Teach for America Teachers' Contribution to
Student Achievement in Louisiana in Grades 4-9:
2004-2005 to 2006-2007***

Analyses were conducted examining the degree to which students who were taught by Teach for America (TFA) corps members exceeded, met, or failed to meet the educational attainment that would be projected for them based on prior achievement and demographic factors. Work began with the augmentation of a large multivariate longitudinal database linking students, teachers, and outcome data that had been developed for a prior study (Noell, Porter, Patt, & Dahir, 2008). This was followed by a model fitting phase in which the hierarchical linear models (HLM) that were developed to predict student achievement based upon prior achievement, student demographic factors, and classroom level covariates in the previous study were adapted to examine TFA corps members' contributions to educational attainment. The models nested students within teachers and teachers within schools. Separate models were developed for each content area. Comparisons were made against all teachers, new teachers, and experienced teachers. In all cases, coefficients for TFA were positive and in 4 of 5 content areas they were statistically significantly different when compared to new teachers. Additional analyses were also conducted to examine the persistence of TFA corps members in teaching beyond the first year. Across samples, new TFA teachers' 5-year persistence in teaching ranged from 4% to 20%. In comparison, the 5-year persistence of new teachers with standard teaching certificates for these cohorts ranged from 62% to 65%.

Technical Report:
Teach for America Teachers' Contribution to
Student Achievement in Louisiana in Grades 4-9:
2004-2005 to 2006-2007

I. Introduction

Two recent reports of the value added assessment initiative of teacher preparation in Louisiana have highlighted the success of programs such as the Masters of Arts in Teaching Program at the University of Louisiana at Monroe and The New Teacher Project (TNTP) across multiple content areas (Noell, Gansle, Patt, & Schafer, 2009; Noell, Porter, Patt, & Dahir, 2008). The success of these programs and the poorer results for some programs has raised a host of questions about candidate selection, content preparation, pedagogical preparation, and the transition into teaching for new teachers. Those questions are being examined as part of an ongoing research initiative by a research team lead by Dr. Jeanne Burns at the Louisiana Board of Regents.

In addition to process questions, the results of the last two value added assessments have raised questions relevant to subgroups within overall preparation program estimates. One noteworthy question has been the role of Teach for America (TFA) corps members within The New Teacher Project (TNTP) program results. The TNTP estimates reflect a mixture of TFA corps members and TNTP teachers who are not affiliated with TFA. Although overall, TNTP may have a large proportion of TFA members enrolled in the program, many of them are not represented in the TNTP estimates because they have not yet received a permanent teaching certificate. They are teaching on a practitioner teacher license. As a result, only 23% to 35% of the teachers in the program estimates across content areas for TNTP in the 2008 report were TFA corps members. This result is a function of the interaction of the length of time it typically takes practitioner teachers to obtain their permanent teaching license and the typical length of service in teaching for TFA corps members.

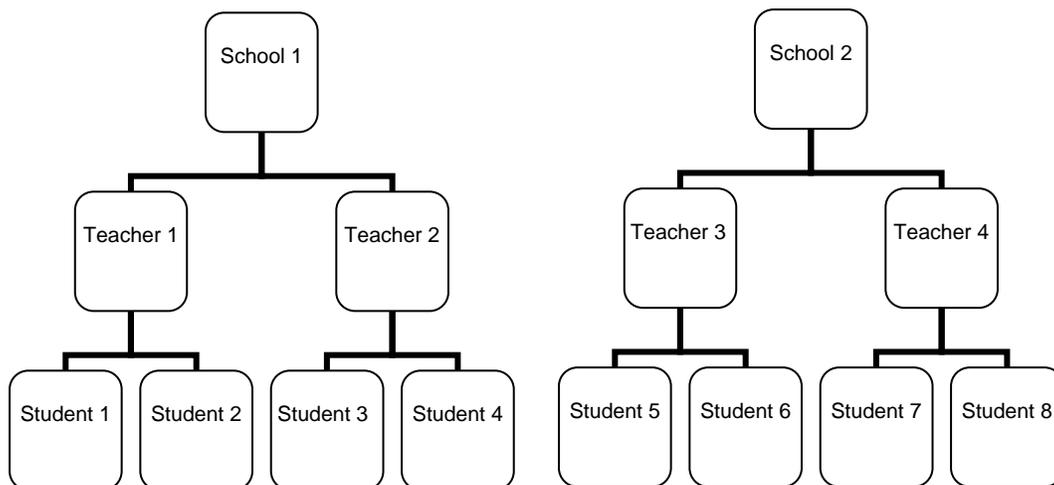
Prior to this issue surfacing, TFA expressed an interest in obtaining an analysis that would be specific to TFA corps members. They provided the research team at LSU a data set that would allow identification of the TFA corps members who were in the analysis completed for the 2008 report (school years 2004-2005, 2005-2006, and 2006-2007). The analyses reported here in are based on the integration of the TFA corps members' data set with the existing longitudinal data set that was developed to complete the value added analysis of teacher preparation reported by Noell and colleagues (2008). This technical report provides an analysis of TFA corps members only. Readers interested in the details surrounding how the broader data sets and models were built are referred to the earlier report. This report will provide some background information regarding the data set and the modifications that were necessary to complete the TFA specific analysis reported herein.

II. Data Merging Process and Base HLM Model Development

The intact longitudinal databases linking students, teachers, and courses for the 2004-2005, 2005-2006, and 2006-2007 school years were used for these analyses. The data were based on students in grades 4 through 9 during those school years. Grades 4 through 9 were examined because those are the grade levels in which state administered standardized test data are available for each spring and for the preceding year. The availability of preceding year test scores provides the most important predictor of current year performance and is necessary for the analyses presented herein. Results were examined for English language arts, reading, mathematics, science, and social studies. The datasets included approximately 160,000 to 250,000 student observations per content area per year taught by approximately 6,000 to 7,000 teachers. The number of student observations was smaller in reading than in other subject areas because relatively few students have reading courses beyond grade 6. The details of the data set assembly are provided in Noell and colleagues (2008). This data set was augmented by adding a variable indicating whether a teacher was a TFA corps member.

Data were analyzed using hierarchical linear models (HLM; McCulloch & Searle, 2001; Raudenbush & Bryk, 2002). The models used in these analyses began with the same base models that were developed in the previous report regarding teacher preparation assessment (Noell et al., 2008). The base models were the multiyear models that used prior achievement, demographic variables, attendance, and school enrollment to model current year achievement prior to consideration of TFA teacher effects. The modeling approach was somewhat parallel to Tekwe and colleagues (2004) in general strategy and has been followed over four years by the Value Added Assessment of Teacher Preparation Programs Project (VAA-TPP) at LSU. Figure 1 below illustrates the nesting structure that was employed.

Figure 1: Nesting Structure of Students within Teachers and Teachers within Schools



At the student level, the model included achievement (5 variables), gender, ethnicity (4 variables), disability (7 variables), free or reduced lunch (2 variables), limited English proficiency, and absences. At the classroom and school building levels, models were tested for the contribution of aggregate variables and those that were significant at $p \leq .01$ were retained. Separate models were developed for each year. Classroom and school building level covariates were used to adjust intercepts for students and classrooms respectively. No covariates were used to predict lower level coefficients and all coefficients were treated as fixed. Error variance was modeled for intercepts with a mean of 0 and common variance at each level. A simplified presentation of the model is provided below. Only equations for intercepts are presented. All other equations (e.g., the level 2 and level 3 models for level one coefficients) were modeled as fixed and not varying. In the equations presented below, \sum is used to indicate summing across the p , q , and s coefficients at the student, teacher, and school levels of the model respectively.

Level 1: Students

$$Y_{ijk} = \pi_{0jk} + \sum(\pi_{pjk})a_{pijk} + e_{ijk}$$

where

- Y_{ijk} is the achievement of student i in class j at school k in the target subject
- π_{0jk} is the adjusted mean achievement for classroom j at school k
- π_{pjk} are the p coefficients that weight the contribution of the student level data in the prediction of Y for $p = 1$ to the total number of coefficients
- a_{pijk} are the student level data (prior achievement, demographic variables, and attendance) that predict achievement for $p = 1$ to the total number of data points
- e_{ijk} the student level random effect, the deviation of the predicted score of student i in classroom j in school k from the obtained score

Level 2: Classrooms

$$\pi_{0jk} = \beta_{00k} + \sum(\beta_{q0k})X_{q0jk} + r_{0jk}$$

where

- π_{0jk} is the adjusted mean achievement for classroom j at school k
- β_{00k} is the mean achievement for school k
- β_{q0k} are the q coefficients that weight the relationship between the classroom characteristics and π_{0jk} , $q = 1$ to the total number of coefficients
- X_{q0jk} are the classroom level data that are used to predict achievement; this is also the location in the model at which codes for recent TPP completers are entered (described below)
- r_{0jk} the classroom level random effect, the deviation of classroom jk 's measured classroom mean from its predicted mean

Level 3: Schools

$$\beta_{00k} = \gamma_{000} + \sum (\gamma_{s00}) W_{s00k} + u_{00k}$$

where

- β_{00k} is the mean achievement for school k
- γ_{000} is the grand mean achievement in the target subject
- γ_{s00} are the s coefficients that weight the relationship between the school characteristics and β_{00k} for s = 1 to the total number of coefficients
- W_{s00k} are the school level data that are used to predict achievement
- u_{00k} the school level random effect, the deviation of school k's measured classroom mean from its predicted mean

Attrition in TFA Teacher Data

It is important to note that there was a significant level of attrition between the number of corps members identified from TFA administrative records and those for whom data were available. From the data TFA provided, 350 teacher cases were identified for whom a valid certification record could be identified for that teacher during the relevant years. Of those teachers, 271 were identified as a teacher of record during the 2005-2006 to 2007-2008 school years. Of these 271 eligible teachers, 127 taught eligible grades and classes. If all teachers taught core subjects one would expect 135 teachers to be available for analysis as approximately half of all teachers teach outside the assessed grade span (e.g., kindergarten or twelfth grade). Some of the additional attrition may be the result of teachers teaching subjects that were not assessed (e.g., French). In order for a teacher to contribute to the analyses, that teacher and their students had to remain together for the bulk of the school year.

III. Assessment of the Contribution of TFA Teachers to Achievement

A series of HLM analyses were conducted across five content areas to examine the extent to which students taught by TFA corps members exceeded, met, or failed to meet the level of educational attainment that would be expected based upon prior achievement and demographic factors. Examining the efficacy of a group of teachers requires specifying a point of comparison. The selection of the comparison describes the plausible alternative teacher assignment that would have occurred if those students had not received a TFA teacher. This alternative has been described as the plausible counterfactual (Rubin, 1974).

The difficulty in specifying this comparison is that there are a number of plausible alternatives. For example, it is plausible that a student may receive a TFA corps member as a teacher in lieu of another new teacher, or in lieu of an uncertified teacher, or in lieu of an experienced teacher. In order to examine the implications of these points of comparison, different controls were entered into a series of models for each content area to illustrate the impact of different assumptions about the relevant comparison.

In Model 1, an indicator variable was entered at level 2 to indicate whether a teacher was a TFA corps member. Model 1 was the comparison of TFA corps members to all teachers with no additional specification. In Model 2, indicator variables were added to control for years of experience. Indicators were added for 1, 2, 3-10, and more

than 10 years of experience. Model 2 examined the effectiveness of TFA teachers controlling for years of experience. Model 3 compared TFA corps members directly to first and second year teachers (new teachers). The results of Models 2 and 3 are closely parallel as TFA teachers were overwhelmingly first and second year teachers (86%) and were nearly balanced between first and second year teachers. Model 4 was added to parallel the models used in the value added assessment of teacher preparation reports. In this model, indicators were entered for certification status and for being a first or second year teacher other than TFA members. As such, in this analysis the comparison is with experienced teachers teaching in their area of certification.

A final issue in specifying the model was whether to use the data from just the districts that employed TFA teachers or from the entire State. Models were run for both the whole State and the select districts. In all cases, the obtained coefficients and probability values were quite close to one another. In order to leverage the available data to the maximum degree possible, the results presented here are those that use the entire State database. This also places these results in the same context as value added assessment of teacher preparation reports (Noell et al., 2009; Noell et al., 2008).

The key findings are presented graphically in Figures 2 through 6 and numerically in Table 1 below. The coefficients indicate the degree to which students taught by TFA teachers exceeded projected achievement based on the HLM. The coefficients are derived from the scale of the Louisiana Educational Assessment of Progress (*LEAP*) which has a mean of approximately 300 and standard deviation of approximately 50 across content areas and years. To facilitate comparison across content and areas, scores were standardized so that the standard deviation would be exactly 50 across years and content areas.

The results are strikingly consistent across subjects. In all content areas and in all comparisons, the coefficient obtained was positive. In all cases the results for the comparison to all teachers were positive, but were not statistically significant. In some of these cases it is quite plausible that with a larger sample of TFA teachers, coefficients of these magnitudes might become statistically significant (e.g., mathematics). Similarly, although they possessed a positive value, the coefficients for comparisons to experienced teachers were not statistically significantly different. It is important to note that TFA teachers are overwhelmingly first and second year teachers and that previous research in Louisiana has found statistically significant differences favoring experienced teachers over new teachers. If these results were placed in the context of the Value Added Assessment of Teacher Preparation model they would have fallen at Level 2 (see Noell et al., 2008, 2009). Level 2 results have been described as more similar to experienced teachers than typical new teacher performance.

When TFA teachers' coefficients for student achievement were compared to new teachers (first and second year teachers) as a group, they were positive and statistically significant for English language arts, reading, mathematics, and science. The social studies result was consistent with findings from other subjects, but was not statistically significant. This is likely the result of a smaller sample in social studies and the generally greater variance for data surrounding the social studies assessments.

Figure 2: English Language Arts Results

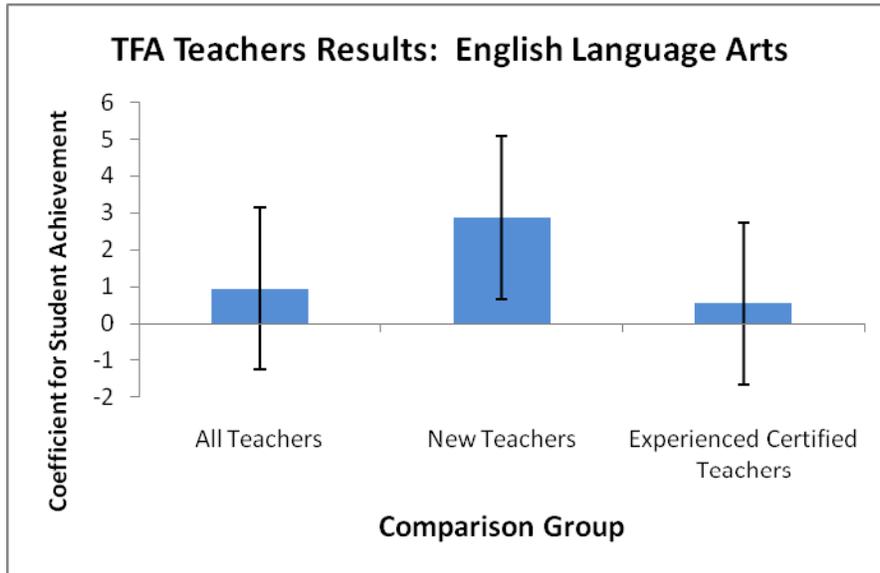


Figure note. The height of the colored bar represents the coefficient for the degree to which TFA teachers' students exceeded expected achievement based on the HLM. The vertical black error I-bars illustrate the 95% confidence interval around the coefficient. In instances in which the error bar does not overlap with the *x*-axis, TFA teachers were significantly different from other teachers ($p < .05$).

Figure 3: Reading Results

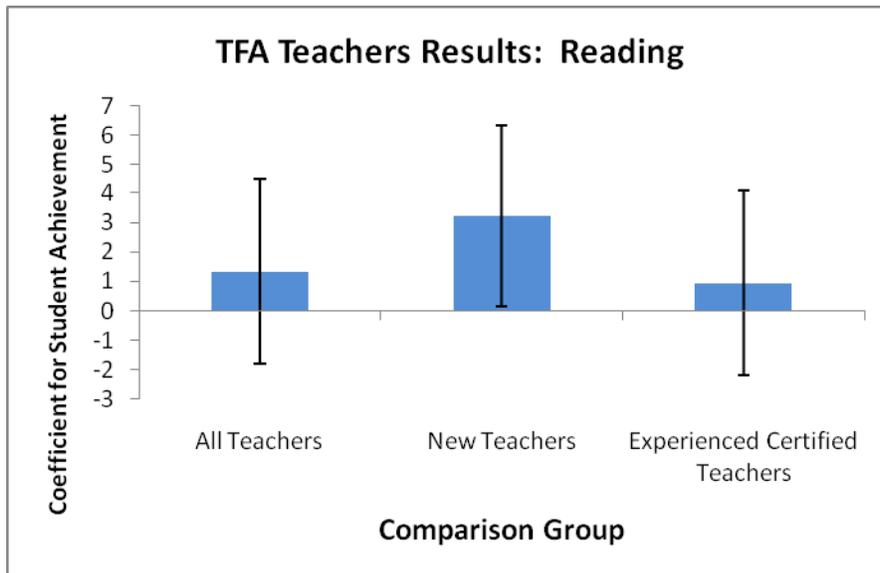


Figure note. The height of the colored bar represents the coefficient for the degree to which TFA teachers' students exceeded expected achievement based on the HLM. The vertical black error I-bars illustrate the 95% confidence interval around the coefficient. In instances in which the error bar does not overlap with the *x*-axis, TFA teachers were significantly different from other teachers ($p < .05$).

Figure 4: Mathematics Results

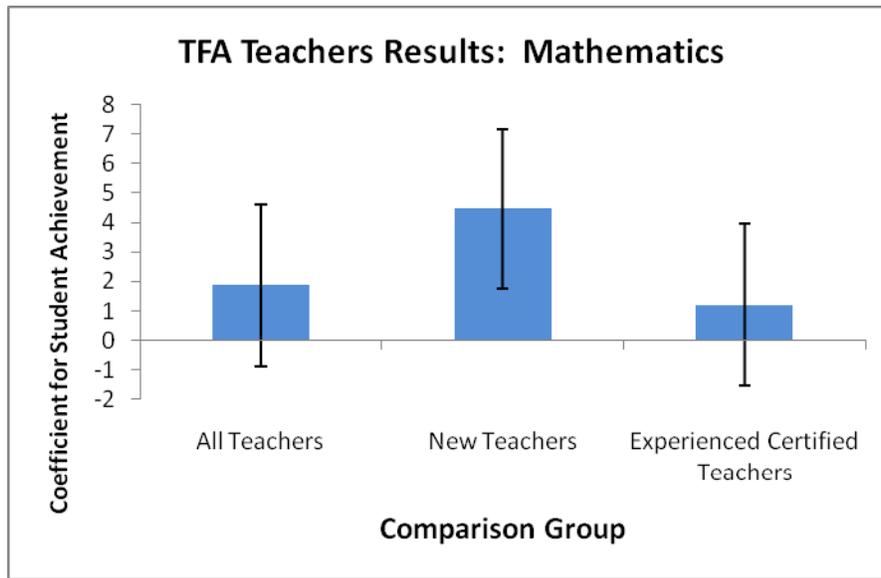


Figure note. The height of the colored bar represents the coefficient for the degree to which TFA teachers' students exceeded expected achievement based on the HLM. The vertical black error I-bars illustrate the 95% confidence interval around the coefficient. In instances in which the error bar does not overlap with the *x*-axis, TFA teachers were significantly different from other teachers ($p < .05$).

Figure 5: Science Results

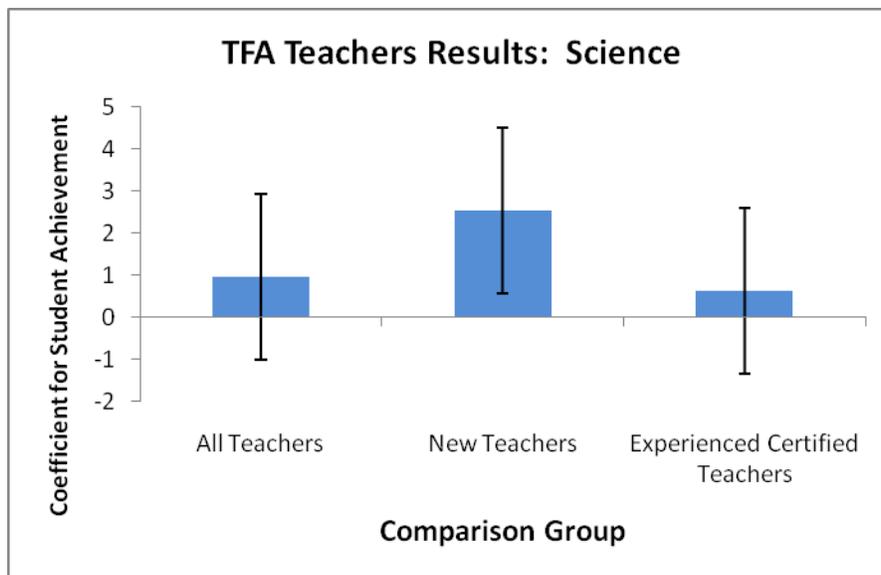


Figure note. The height of the colored bar represents the coefficient for the degree to which TFA teachers' students exceeded expected achievement based on the HLM. The vertical black error I-bars illustrate the 95% confidence interval around the coefficient. In instances in which the error bar does not overlap with the *x*-axis, TFA teachers were significantly different from other teachers ($p < .05$).

Figure 6: Social Studies Results

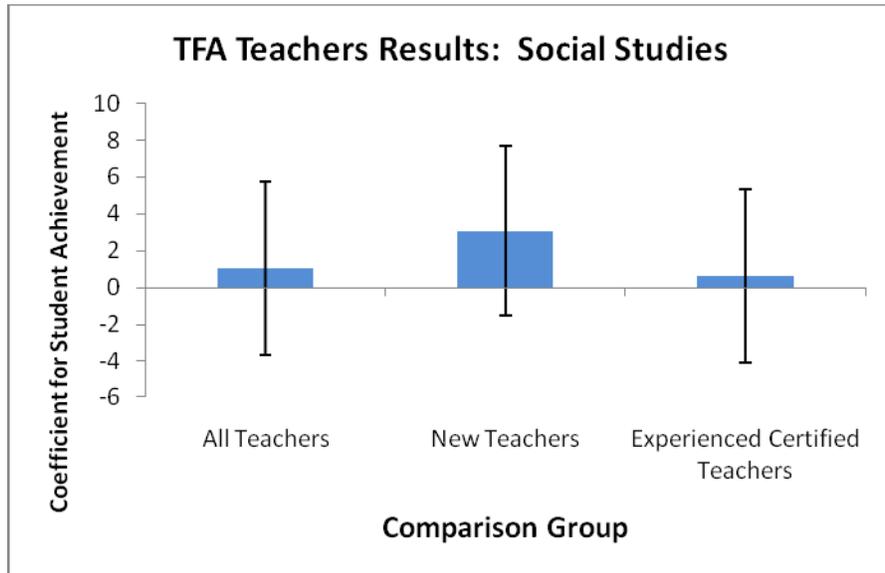


Figure note. The height of the colored bar represents the coefficient for the degree to which TFA teachers' students exceeded expected achievement based on the HLM. The vertical black error I-bars illustrate the 95% confidence interval around the coefficient. In instances in which the error bar does not overlap with the x -axis, TFA teachers were significantly different from other teachers ($p < .05$).

Table 1: Assessment Results across Content Areas and Comparison Groups

	All Teachers	Controlled for Experience	New Teachers	Experienced Certified Teachers
English Language Arts	0.94 (-1.2, 3.1) $p = 0.40$ $n = 70$	2.76 (0.6, 4.9) $p = 0.01$ $n = 70$	2.87 (0.7, 5.05) $p = 0.01$ $n = 70$	0.54 (-1.6, 2.7) $p = 0.62$ $n = 70$
Reading	1.33 (-1.8, 4.4) $p = 0.41$ $n = 42$	2.69 (-0.6, 5.99) $p = 0.10$ $n = 42$	3.23 (0.09, 6.37) $p = 0.047$ $n = 42$	0.94 (-2.2, 4.0) $p = 0.56$ $n = 42$
Mathematics	1.87 (-0.83, 4.57) $p = 0.17$ $n = 89$	4.23 (1.7, 6.7) $p < 0.001$ $n = 89$	4.46 (1.79, 7.13) $p = 0.001$ $n = 89$	1.21 (-1.5, 3.9) $p = 0.37$ $n = 89$
Science	0.96 (-1.0, 3.0) $p = 0.34$ $n = 73$	2.26 (0.3, 4.3) $p = 0.03$ $n = 73$	2.54 (0.53, 4.55) $p = 0.014$ $n = 73$	0.62 (-1.4, 2.6) $p = 0.53$ $n = 73$
Social Studies	1.02 (-3.7, 5.7) $p = 0.67$ $n = 42$	2.69 (-1.8, 7.2) $p = 0.24$ $n = 42$	3.07 (-1.58, 7.72) $p = 0.196$ $n = 42$	0.66 (-4.0, 5.4) $p = 0.78$ $n = 42$

Table note. The top number in each cell is the coefficient based on the typical mean (300) and standard deviation (50) of Louisiana's assessment instruments. The values in parentheses are the 95% confidence interval. The p value is the probability value of the test of statistical significance for that coefficient. The n is the number of observations of teachers within years.

IV. Persistence of TFA Teachers in Teaching

An additional area of interest regarding TFA teachers is the extent to which they persist in teaching. One of the concerns expressed about TFA has been that corps members do not contribute to the enduring teacher workforce. An additional set of analyses was conducted examining the persistence in teaching of TFA corps members as

compared to new teachers with standard licenses and teachers with practitioner licenses. The new teachers with standard licenses typically would be new program completers from undergraduate teacher preparation programs. The other teachers with practitioner licenses would be new teachers in practitioner training programs who were not enrolled through TFA. These include both university-based programs and private providers.

The figures below present the percent of new teachers for each beginning year that persisted in teaching each subsequent year. This analysis was not dependent upon the HLM analyses above. Teachers could contribute to these analyses regardless of the grade level or content area in which they taught. For each year, all first time teachers were identified as TFA members, practitioner teachers, or new teachers with a standard license. The persistence in teaching of each of these groups was then followed.

Records were located and followed for 132 first time TFA teachers for 2003-2004, 96 for 2004-2005, and 104 for 2005-2006. Not surprisingly given the design of TFA, teacher persistence in teaching is similar to other paths into teaching for the second year, but then drops off dramatically following that year. For example, while 65% of new teachers with standard certificates were still teaching 5 years later for the entrants of 2003-2004 only 4% of TFA teachers were still teaching in Louisiana. The subsequent years demonstrated somewhat higher persistence with 20% of the class of 2004-2005 persisting 5 years and 18% of the class of 2005-2006 persisting 4 years.

Figure 7: Persistence in Teaching by Licensure 2003-2004

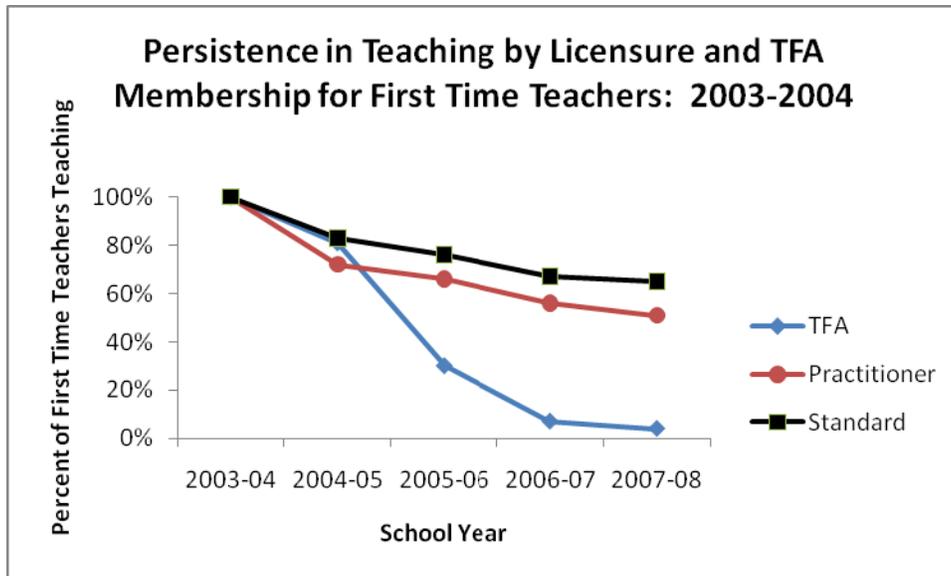


Figure 8: Persistence in Teaching by Licensure 2004-2005

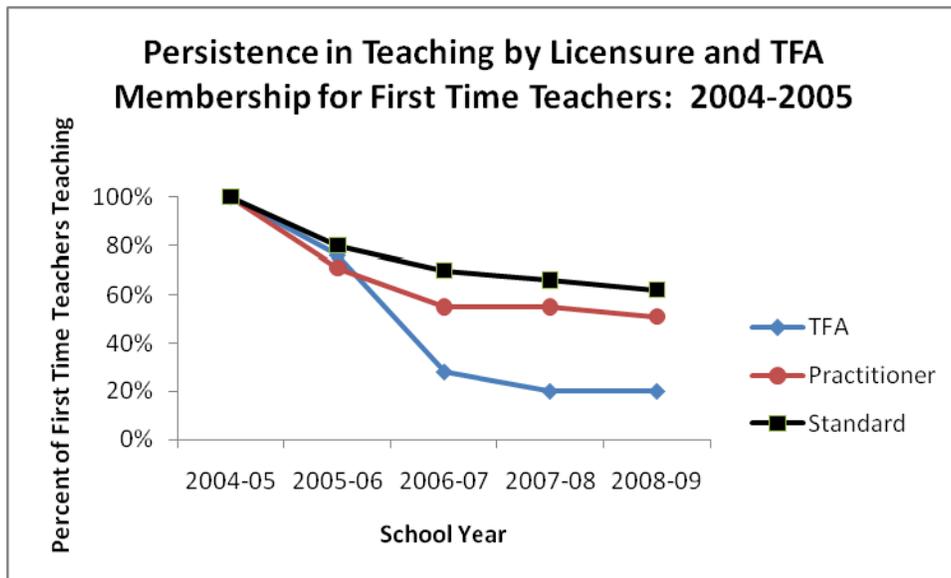
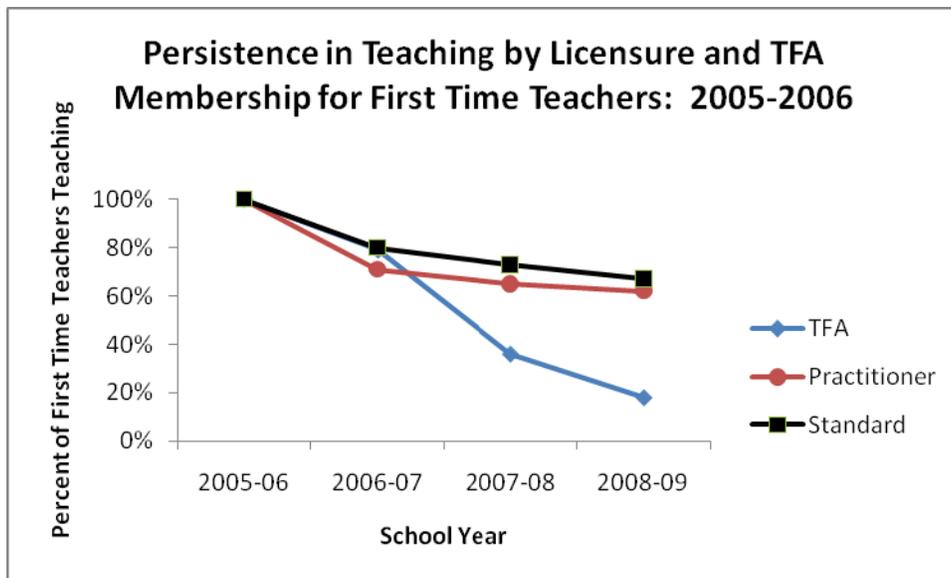


Figure 9: Persistence in Teaching by Licensure 2005-2006



V. Summary

Results are strikingly consistent across content areas. In all areas except for social studies, TFA corps members were statistically significantly more effective than other new teachers. The magnitude and direction of the result in social studies is consistent with the

other content areas, but due to greater variability within the social studies domain and a smaller number of observations, the result was not statistically significant. Although none of them achieved statistical significance, the coefficients for TFA corps members were positive when compared to experienced teachers teaching in their area of certification. However, given the magnitude of the difference, if it held in a larger sample, it would take a large sample of TFA members for an effect of this magnitude to achieve statistical significance. It is also worth noting that within the Louisiana studies, comparisons between experienced and new teachers have statistically significantly favored the experienced teachers. This is particularly salient as these TFA teachers are overwhelmingly first and second year teachers. If their results were consistent with previous overall findings in Louisiana, one would expect them to perform more poorly than experienced teachers.

The persistence in teaching data clearly demonstrate that a small minority of Louisiana TFA corps members persist to the fourth year in teaching and beyond. Persistence across the three cohorts examined out to the fourth year ranged from 7% to 20% of each year cohort remaining in teaching in Louisiana. Overall, the data suggest that TFA corps members may be more comparable to experienced certified teachers than new teachers in their effectiveness, but that few of them persist in teaching in Louisiana beyond three years.

References

- McCulloch, C. E., & Searle, S. R. (2001). *Generalized, linear, and mixed models*. New York: Wiley.
- Noell, G. H., Gansle, K. A., Patt, R. M., & Schafer, M. J. (August, 2009). *Value Added Assessment of Teacher Preparation in Louisiana: 2005-2006 to 2007-2008*. Baton Rouge, LA: Louisiana State University, Department of Psychology.
- Noell, G. H., Porter, B. A., Patt, R. M., & Dahir, A. (2008). Value added assessment of teacher preparation in Louisiana: 2004-2005 to 2006-2007.
[http://www.regents.state.la.us/Academic/TE/2008/Final%20Value-Added%20Report%20\(12.02.08\).pdf](http://www.regents.state.la.us/Academic/TE/2008/Final%20Value-Added%20Report%20(12.02.08).pdf)
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd Ed.). London: Sage.
- Rubin, D. B. (1974). Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology*, 66, 688-701.
- Tekwe, C. D., Carter, R. L., Ma, C., Algina, J., Lucas, M. E., Roth, J., Ariet, M., Fisher, T., & Resnick, M. B. (2004). An empirical comparison of statistical models for value-added assessment of school performance. *Journal of Educational and Behavioral Statistics*, 29, 11-37.