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ABSTRACT

This longitudinal study was designed to ascertain if those teacher candidates (N=388) having failed to make or having made a more or less successful transition into the teaching field 7 years after the commencement of teacher preparation differed in academic aptitudes and academic abilities assessed upon commencement of teacher preparation. MANOVA procedures completed on the set of 12 Comprehensive Test of Basic Skills and American College Test scores did not consistently reveal differences among those teacher candidates who graduated but did not become certified as teachers, became certified as teachers but did not teach, became part-time teachers, and those who became full-time teachers. Relationships and statistical interactions, however, were identified between the candidates' major, gender, assurance about becoming teachers, degree of successful transition from college students to teachers, and academic aptitudes and abilities. The gathered data generally supported the hypothesis that attrition during teacher preparation and the early years of teaching does not necessarily reduce the quality of the remaining teaching pool as suggested by some earlier research findings. Nevertheless, some of the findings did lend support to the marketability theory of teacher attrition which predicts the loss of more capable candidates due to the availability of other employment opportunities. (Contains 17 references; data tables and figures are attached.) (Author/ND)

Running Head: ATTRITION AND TEACHER ABILITY

Academic Aptitude and Ability Characteristics of Candidates Teaching and Not Teaching Five Years After Graduation

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Abstract

This longitudinal study was designed to ascertain if those teacher candidates (N=388) having failed to or having made a more or less successful transition into the teaching field seven years after the commencement of teacher preparation differed in academic aptitudes and academic abilities assessed upon commencement of teacher preparation. MANOVA procedures completed on the set of 12 Comprehensive Test of Basic Skills andAmerican College Test scores did not consistently reveal differences among those teacher candidates who graduated but did not become certified as teachers, who became certified as teachers but did not teach, who became part-time teachers, and those who became full-time teachers. Relationships and statistical interactions, however, were identified between the candidates' major, gender, assurance about becoming teachers, degree of successful transition from college students to teachers, and their academic aptitudes and abilities. The gathered data generally supported the hypothesis that attrition during teacher preparation and the early years of teaching does not necessarily reduce the quality of the remaining teaching pool as suggested by some earlier research findings. Nevertheless, some of the findings did lend support to the marketability theory of teacher attrition which predicts the loss of more capable candidates due to the availability of other employment opportunities.

Academic Aptitude and Ability Characteristics of Candidates Teaching and Not Teaching Five Years After Graduation

Various theoretical models have been devised to explicate the factors influencing recruitment to and attrition from the teaching profession. For example, Weaver (1983) states that an individual's marketability in our society is the foremost influence upon both teacher attrition and recruitment. He notes that teachers with more marketable talents are less likely to be attracted to teaching initially and, if teaching, they are more likely to be attracted to lucrative employment out of the profession. Relatedly, he indicates that increased career opportunities in recent years for talented women and for minorities, concomitant with the declining attractiveness of schools as a work place, is having and will continue to have a major detrimental impact upon the quality of available teachers.

In contrast to Weaver's single factor marketability model, Chapman (1983) constructed a multi-factor model to explain teacher recruitment and attrition. His research and that of his colleagues have revealed that factors such as candidates' personal characteristics, initial commitment to teaching, degree of success in teaching, career satisfaction, and quality of first employment placement, as well as external employment climate or marketability are all associated with entry to and attrition from the teaching profession (Chapman, 1984; Chapman & Green, 1986; Chapman & Hutcheson, 1982).

Contrary to some early research findings suggesting that attrition from the teaching profession typically has a detrimental impact upon the quality of the remaining teaching pool (Bloland & Shelby, 1980; Chapman & Hutcheson, 1982; Marso & Pigge, 1991; Schlechty & Vance, 1983; Schlechty & Vance, 1981), a few more recent longitudinal studies suggest that attrition from the profession may not necessarily have a negative impact upon the talent of the remaining candidate pool. Pigge and Marso (1992) reported that the more capable individuals within a longitudinal sample of teacher candidates successfully progressed through teacher training, and, similarly, Heyns (1988), analyzing data from a large, national longitudinal study, found that attrition from teaching had not decreased the ability and qualifications of those teaching. Heyns also noted that in order to understand teacher attrition one must adjust for the considerable mobility within the teaching field and must be aware that approximately one-fourth of those completing teacher preparation never teach.

Other researchers have found race, subject specialty, elementary or secondary assignment, salary, and National Teacher Examination (NTE) scores to be related to attrition from teaching. For example, Murnane, Singer, and Willet (1989) found that teachers with higher NTE scores were more likely to leave teaching, and thus lending support to the marketability theory of attrition. Specifically, they identified much higher attrition rates for teachers with subject specialties valued by business and industry (e.g., chemistry, physics, and biology) than for those teachers with subject specialties less valued by business and industry (e.g., social studies and history). Relatedly, secondary teachers, who generally possess more marketable skills, were found to more frequently leave during the early years of teaching than the elementary teachers. These researchers also noted that White teachers were more likely to leave teaching than Black teachers and that teachers with higher salaries were more likely to remain in teaching. Jacobson (1988) reported similar relationships between gender, salary, teacher marketability, and teacher attrition in New York.

To accurately estimate the supply of teachers, one has to assess the rate of persistence of students in teacher preparation, the actual rate of entrance into the teaching field by those prepared to teach, and the mobility or length of time spent teaching of those actually becoming teachers while at the same time assessing prevailing employment market conditions. Most attrition from teaching occurs during the early years of teaching, and many teachers leaving the profession plan to and do return to teaching. Furthermore, to accurately assess the demand for and supply of teachers, it is essential to take into consideration that the larger percent of annual new teacher employments in schools are teachers transferring from other school districts and teachers returning to teaching from other activities rather than newly certified university graduates. Moreover, this trend of schools hiring experienced rather than just prepared teachers appears to be increasing. For example, Murnane, Singer,

and Willet (1988) found that for the newly prepared White teachers hired between 1976 to 1978 in North Carolina who had left teaching early, approximately 30 percent of these individuals had returned to teaching again by 1986. These researchers also noted that from 1966 to 1986 schools hiring of experienced teachers not having taught the prior school year increased from 33 percent to 84 percent. One of their less positive findings related to teacher mobility and attrition in North Carolina was that the more capable teachers and those more attractive to industry and business (e.g., those with higher NTE scores and secondary teachers with subject specialties sought by business and industry) were less likely to return to teaching.

Similar trends in teaching attrition were identified in a Michigan study during the 1970s (Murnane, 1987). Fifteen percent of the new teachers left teaching before completing two years in the classroom, another nine percent left before three years, and just 56 percent were teaching six years after they began teaching. More women had left teaching (48%) than men (35%) during the first six years after the completion of teacher preparation; the majority of new hirings in the State were of experienced teachers not having taught the prior school year; and relationships were found between attrition from teaching and teachers' salary level and subject specialty.

Closely related to the present study, Nelson (1985), studying data from the National Longitudinal Survey (NLS) of the high school class of 1972, found that teacher candidates less successful in making the transition from students to teaching (e.g., those teaching part-time rather than full time) had scored as high in some content areas of the SAT, ACT, and the NLS measures as their more successful cohorts, but they had scored lower in the mathematics and reading areas. Furthermore, those candidates who did not teach, as compared to those who did teach, scored higher on the SAT verbal score. Thus, both the schools and the non-educational employers appeared to be selecting the more capable candidates from those available to them. Nelson also noted that public school teachers had higher test scores than private school teachers and that the private school teachers had higher attrition rates than did public school teachers. Relative to the question of the ability of those aspiring to be teachers versus those aspiring to enter other professions, Nelson found that one must question the accuracy of those studies solely based upon the career aspirations of high school pupils. Almost 80 percent of the NLS sample of 1972 high school seniors who planned to teach never became teachers, and just 25 percent of those who actually became teachers had planned to do so as high school seniors. Lyson and Falk (1984) and Heyns (1988), also working with the NLS class of 1972 data base, reached similar conclusions. In particular, these researchers concluded that many less able high school seniors who never went to college had declared teaching as their career; whereas many very capable students who later became teachers never declared teaching as their career in high school. When comparing those high school students who actually became teachers with students actually entering other professions, they found less evident ability differences between the two groups having actually entered the various professions than those differences noted between high school students aspiring to be teachers and aspiring to enter other professions.

The 1991-92 Teacher Follow-up Survey, conducted on a sample of teachers participating in the Teacher Survey of the 1990-91 Schools and Staffing Survey, revealed characteristics of teachers classified as "leavers," "movers," and "stayers" during the 1990-91 and 1991-92 school years (National Center For Educational Statistics, 1994). This survey revealed teacher annual attrition rates of 5.1 percent from public schools and 12.3 percent from private schools. These rates were noted to be almost identical to the attrition rates identified between the 1987-88 and 1988-89 school years. Differences in attrition rates were noted for subject specialty (e.g., higher in math and science and lower in reading and social studies) and for time in career of the teachers (e.g., higher for early and late career including retirements and lower for mid-career, namely, 7.5, 14.3, and 2.9 percent respectively for public schools). The "movers" in public schools primarily were public school teachers moving to other public schools (94.3%); whereas the "movers" in private schools primarily were private school teachers moving to public schools (47.2%). About 15 percent of the "leavers" from the teaching profession expected to return to teaching. The two primary reasons given for leaving the teaching profession were low salaries and dissatisfaction with teaching. The next, but by far less frequent than the first two, most common

reason for leaving was inadequate support from administrators. Other reasons given by former public school teachers for not teaching included homemaking/child rearing (18.6%) and retirement (33.3%). Those "leavers" who had left teaching reported employment by private business (69.3%) or government (18.8%), and self-employment (11.9%).

In summation, the existing research literature suggests that attrition from teaching is influenced by a variety of factors that are probably best revealed by the study of longitudinal samples of teachers. The purpose of the present study was to compare the academic abilities and academic aptitudes of a longitudinal sample of teacher candidates who had four varying levels of success in making the transition from students to teachers when assessed seven years after the commencement of teacher preparation to test the general hypothesis that attrition from teacher preparation and the early teaching years does not necessarily reduce the quality of the remaining teaching pool. More specifically, this study was designed to answer the following types of questions: 1) Are the more capable teacher candidates, as indicated by American College Test and Comprehensive Test of Basic Skills scores, more likely than their less able cohorts to progress through teacher training? to acquire teacher certification? 2) Are the more capable teacher candidates more likely than their less able cohorts to become full-time teachers rather than part-time teachers? 3) Are characteristics of teacher candidates such as gender, planned level of instruction, time at which they made the decision to teach, and the extent of their initial assurance about becoming a teacher associated with the successfulness of their transition from students to teachers?

Methods and Procedures

The subjects for the present study consisted of a longitudinal sample of 388 teacher candidates from whom data were gathered at the commencement of teacher preparation and again seven years later. Upon the beginning of teacher preparation the teacher candidates reported various personal characteristics such as their degree of assurance about becoming a teacher, gender, planned level of instruction, the time at which they first decided to become teachers, and they completed the Comprehensive Test of Basic Skills (CTBS). Additionally, their American College Test (ACT) scores were obtained from university admission records. Finally, seven years after the commencement of teacher preparation, individual, parent, alumnae office, and State Department of Education contacts were made to determine whether the candidates had become certified as teachers, whether or not they were presently teaching, and the extent of their teaching experience, if any, since graduation.

This sample of teacher candidates beginning their teacher preparation at a large midwestern teacher preparation institution during 1985 were predominately White (98%), female (81%), elementary (57%) and secondary (43%) majors, very certain or almost certain about teaching (88%), from families with teachers in the present or prior generation (60%), children of parent or parents not holding four-year college degrees (67%), from somewhat larger families (46% with three or more siblings), second or later birth order (66%), with some or considerable prior teaching-like experiences (73%), very confident about becoming unusually good to exceptionally effective future teachers (78%), from rural (33%) or suburban (54%) high schools of moderate to small size (61% with high school graduating classes of 300 or less), and most had first decided to teach when in their elementary school years (24%) or when in their high school years (50%).

Univariate two-way ANOVAs were used to ferret out probable causes of initial significant F values derived from two-way MANOVAs related to testing (1) whether seven years after the commencement of teacher preparation, part-time teachers (e.g., presently part-time, substitute or temporary full-time teachers with less than two years of full-time teaching experience), full-time teachers (currently full-time with more than two years of full-time teaching experience), candidates who graduated but who had not become certified as teachers, and candidates who had been certified as teachers but had not taught differed in academic aptitude and basic academic skills (ACT and CTBS scores) upon entering teacher preparation; (2) whether the personal characteristics of the candidates such as gender, planned level of instruction, degree of assurance about becoming teachers, and when they

first decided to teach, were related to the ACT and CTBS scores among the candidate groups, and (3) whether any statistical interactions existed between the candidates' levels of success in the transition from college students to teachers and the aforementioned candidate characteristics for the set of twelve ACT and CTBS scores.

The ACT (English, mathematics, social science, national science, and composite) and CTBS (vocabulary, reading comprehension, spelling, language mechanics, language expression, mathematics computation, and mathematics concepts and application) scores were used as the set of dependent variables in these analyses. The classification of the candidates' success in making the transition from student to teaching (not certified as teachers, certified but no teaching experience, part-time teachers, and full-time teachers) seven years after the commencement of their teacher preparation was the independent variable of primary interest (column classification), and the classifications of the candidates by gender, degree of assurance about becoming a teacher at the commencement of teacher preparation (very certain, certain, and doubtful), level of instruction (elementary and secondary), and time when the decision to teach was made (during the elementary grades, during high school years, and after high school graduation) were used as a series of four second independent variables (row classifications) in the two-way MANOVA and ANOVA procedures.

Results

The two-way MANOVA procedure revealed a difference at the .0736 alpha level in the set of dependent variables made up of the five ACT and the seven CTBS scores when testing for mean differences between the four levels of the extent of successful transition from students to teachers. The two-way MANOVA procedures also revealed significant effects for the gender classification ($F = 4.76$, $p < .0001$) and the instructional level of the candidates ($F = 2.00$, $p = .0234$), but no significant differences for the teachers' initial assurance about their decision to become teachers ($F = 0.93$, $p = .5649$) and the time at which the candidates first decided to become teachers ($F = 1.26$, $p = .1821$) classifications (see Table 1). Also these procedures revealed significant statistical interactions between the extent of successful transition from student to teacher and the initial degree of assurance about teaching ($F = 1.45$, $p = .0094$).

Insert Table 1 about here

Candidates' Assurance About Teaching

The results of the MANOVA procedures ($.10 < p > .05$) prompted the application of two-way univariate ANOVA follow-up procedures to investigate possible mean differences between the extent of successful transition to teaching and the degree of initial assurance about becoming teachers classifications and related statistical interactions. The univariate two-way ANOVA procedures involving the extent of successful transition and the degree of assurance about teaching classification revealed that the not certified candidates had the highest ACT English ($\underline{M} = 19.64$), ACT social science ($\underline{M} = 20.25$), ACT natural science ($\underline{M} = 21.98$), ACT composite ($\underline{M} = 20.21$) and CTBS vocabulary ($\underline{M} = 35.42$) mean scores among the four groups of candidates. Three of these five sets of mean differences just approached statistical significance ($.10 < p > .05$) but the other two diffrences were significant (see Table 2). These not certified candidates also had the second highest CTBS ($M = 33.68$) reading comprehension ($F = 2.91$, $p = .0342$), but just third highest CTBS ($M = 25.61$) math computations ($F = 2.68$, $p = .0469$) scores among the four groups of candidates.

Insert Table 2 about here

The magnitudes of the row means for the four transition groups are highest for all five ACT score areas for the not certified group; are second highest for the part-time teaching group for four of the five ACT means; and are lowest in all five areas for the full-time teachers who were apparently most effective in making the transition from college students to teachers. This pattern would suggest that the most capable teacher candidates (as indicated by ACT scores) do not become teachers as hypothesized by the marketability thoery of teacher attrition. A second disheartening element of the ACT mean pattern for this sample of teacher candidates appears to be that the school systems are "selecting" the candidates with lower ACT scores to become their full-time teachers rather than their part-time teachers.

The various extent of successful transition group means for the CTBS scores, however, do not reveal a clear pattern of differences as was just described for the ACT means. The pattern here indicates the part-time teaching group had the lowest entering basic academic skills score means for six of the seven CTBS skill areas and second lowest skills score means for the seventh CTBS skill area. In contrast, the full-time teaching group had the highest CTBS math computation and math concepts and the highest spelling skill means of all four transition groups and higher skill means for the four remaining CTBS skill areas than did the part-time teachers. Thus, the two measures collectively suggest that the full-time teachers in this sample had somewhat lower scholastic aptitude (ACT scores) but comparable or even higher basic academic skills (CTBS scores) upon commencement of teacher preparation as compared to their non-teaching or part-time teaching cohorts.

None of the ACT or CTBS mean differences resulting when the candidates were classified as very certain, certain, or uncertain about becoming teachers upon commencement of teacher preparation approached statistical significance (see Tables 1 and 2). Three degree of assurance X extent of successful transition interactions, however, were found to be statistically significant (see Tables 1 and 2). These interactions involved the CTBS reading comprehension ($F = 2.42$, $p = .0264$), language expression ($F = 2.44$, $p = .0249$), and the math computations scores ($F = 3.20$, $p = .0045$).

For illustrative purposes, a graph of the extent of transition X degree of assurance about teaching interaction for the CTBS reading comprehension means is shown in Figure 1. This interaction indicates that the part-time teachers who were uncertain about teaching upon the commencement of teacher preparation had relatively low reading comprehension skills while the full-time teaching and non-teaching groups had reading comprehension skills as high or higher than their cohorts. This pattern of means is also evident for the CTBS language expression skills, as shown in Figure 2; while also suggesting that the uncertain about teaching candidates in the two not teaching categories had somewhat higher language expression skills than their teaching cohorts. A relatively similar mean pattern is also evident for the CTBS math computation skills interaction; however, the not certified graduates who had been very certain about teaching also had quite low math computation skills as shown in Figure 3. Considering these three interactions collectively, it would appear that for some candidates, but clearly not all candidates, an awareness of their relatively low skill levels in reading, writing, and math may have made them feel uncertain about becoming teachers upon the commencement of teacher preparation. Using the same logic, it would seem then that for most of the other teacher candidates their initial uncertainty or certainty about becoming teachers was not related to the levels of their scholastic aptitude and basic academic skills as measured by the ACT and CTBS.

Insert Figures 1, 2, and 3 about here

Candidates' Gender

Both the MANOVA and ANOVA procedures indicated that the candidates' performance on the ACT and CTBS measures varied by gender and that gender did not interact with the extent of successful transition from students to teachers (see Tables 1 and 2). Just the English mean among the

ACT score means revealed a gender difference (F = 4.98, p = .0262) with females (M = 18.78) earning higher scores than the males (M = 16.23). In contrast, three of the seven CTBS scores revealed statistically significant mean differences (p < >05) in favor of the female candidates with but one mean difference just approaching statistical significance (.10 < p > .05) in favor of the males.

The female candidates scored higher than the male candidates in CTBS spelling skills (M = 23.05, M = 21.46, F = 4.64, p = .0319), CTBS language mechanics skills (M = 21.58, M = 19.58, F = 7.17, p = .0078), and language expression skills (M = 35.67 and M = 33.39, F = 5.63, p = .0183). In contrast, the CTBS vocabulary skills mean of the males was somewhat higher, but just approaching statistical significance, than that of the females (M = 35.71, M = 33.64, F = 3.34, p = .0683). Generally, these findings would suggest that that upon the commencement of teacher preparation the female candidates had higher English aptitude as well as higher spelling and writing skills than did the male candidates; whereas for the other aptitude and academic skill means the two gender groups were comparable.

Insert Table 3 about here

Candidates' Instructional Levels

The MANOVA procedures indicated that the elementary and secondary majors differed somewhat on the set of dependent variables upon commencement of teacher preparation (Wilks' Lambda F = 2.00, p = .0234) as shown in Table 1. The follow-up two-way ANOVA procedures, however, indicated that among all dependent variable scores the statistically significant differences were limited to just one of the CTBS scores (see Table 3). The elementary majors scored lower on the CTBS vocabulary skills test (M = 33.41) than did the secondary majors (M = 35.43), F = 6.82, p = .0094. Similarly, the elementary majors in terms of row means scored lower than the secondary majors on 9 of the other 11 tests but just for the reading comprehension test did this difference approach statistical significance (M = 33.94, M = 32.77, F = 3.10, p = .0789). The extent of successful transition X instructional level statistical interaction was not significant (Wilks' Lambda F = 0.97, p = .5208) as shown in Table 1. None of the ACT score mean differences between the elementary and secondary majors approached significance although the pattern of row means favored (i.e., for 3 of the 4 tests) the secondary majors as was the pattern for theCTBS means.

Candidates' First Interest in Teaching

The two-way MANOVA procedures did not reveal statistically significant main effects or interaction effects with extent of transition success for the set of dependent variables when the time of the decision to become teachers was used for classification (see Table 1). Regardless, and primarily for descriptive purposes, univariate F-ratios and group means are presented for these comparisons on Table 3.

These two-way ANOVA procedures did nevertheless reveal what appeared to be a consistent pattern of row means. Ten of the 12 sets of dependent variable means revealed higher CTBS and ACT scores for the candidates who reported having decided to become teachers during the elementary grades as opposed to the high school or post-high school years with three of the F-values being statistically significant (ACT English F = 3.56, p = .0293; CTBS language mechanics F = 4.59, p = .0107; CTBS language expression F = 4.06, p = .0181) and four additional score mean differences were significant at .10 < p > .05. When considering just the high school and post high school groups, the five ACT means were higher for those candidates who had decided to become teachers in high school as compared to after high school, but the opposite is evident for the CTBS means. All seven of the CTBS row means were higher for the after high school group than for those candidates deciding to become teachers during the high school years; however, all five of the ACT obtained means are higher for the

candidates who decided to teach during their high school years. In summation, the time of decision to teach set of ACT and CTBS means, to the extent that they should be interpreted after a non-significant MANOVA F value, suggests that candidates deciding to teach in their elementary grades are somewhat more capable than those deciding to teach in later years.

Summary and Discussion

A longitudinal sample of 388 teacher candidates from a large midwestern teacher preparation institution was studied to determine whether or not more capable teacher candidates are more likely to make a more successful transition from students to teachers than are their less capable cohorts. Comprehensive Tests of Basic Skills (CTBS) and American College Test (ACT) scores were acquired at the commencement of their teacher preparation , and seven years later the extent of their transition from students to teachers was assessed. The candidates were classified by extent of transition to teaching (not certified as teachers, certified but not teaching, part-time teachers, and full-time teachers), time at which they reported having decided to become teachers (elementary, high school, and after the high school years), degree of assurance about becoming teachers upon commencement of preparation (very certain, certain, and uncertain), instructional level (elementary and secondary), and gender. Two-way MANOVA procedures were used to analyze the collected data with the set of seven CTBS and five ACT scores used as the 12 dependent variables and the candidate aforementioned extent of successful transition classifications used as the main independent (column) variable and the other classifications used as (row) independent variables.

The general results from the analyses of the collected data indicated that candidate ability as measured by the CTBS and ACT test was not directly related to the extent of the candidates' success in making the transition from students to teachers. The analyses completed on the set of CTBS and ACT scores revealed non-significant main effects for the transition classification and thereby indicating, contrary to some previous research, that the teaching profession does not lose its more capable candidates during teacher preparation and the early years of teaching. However, closer examinations of the data did not suggest such a clear-cut conclusion. The candidates' extent of successful transition from students to teachers was found to be indirectly related to their initial academic aptitudes and abilities. Gender, instructional level, and degree of assurance were found to interact statistically with the extent of successful transition factor with some of the 12 dependent variables. Also a nearly significant level of transition main effect finding was identified when the candidates' degree of initial assurance about becoming teachers was used as the second main effect in the analyses. These findings collectively were consistent with some prior research findings indicating that attrition during teacher preparation and the early years of teaching may reduce the academic quality of the remaining teaching pool. The findings from the present study suggest that those candidates not becoming certified as teachers had somewhat higher ACT scores than their certified cohorts, and those candidates most successful in their transition from students to teachers (full-time teachers) had somewhat lower ACT scores than their part-time teaching cohorts. The full-time teachers, however, were more comparable to their less successful cohorts relative to their initial basic academic skills as assessed by the CTBS scores.

The findings related to the ACT scores suggest that: (1) The most capable teacher candidates do not become certified as teachers as predicted by the marketability theory of teacher attrition (Weaver, 1983). (2) Of those candidates becoming certified as teachers, the public schools appear to be selecting the candidates with lower academic aptitudes to fill their full-time teaching positions. And, findings related to CTBS scores suggest that: (1) Candidates not teaching are likely to have higher vocabulary and higher reading comprehension skills than their teaching cohorts, but full-time teachers are likely to have higher math computation skills than their non-teaching or part-time teacher cohorts. (2) The public schools appear to be able to differentiate between the less certain about teaching candidates with lower reading comprehension, language expression, and math computation skills and their cohorts who were more certain about becoming teachers and possessed higher levels of skills. The certain about teaching candidates with higher academic skills were more likely to be full-

time rather than part-time teachers. And, collectively, the pattern of ACT and CTBS means found in the present study suggest that full-time teachers had somewhat lower scholastic aptitude (ACT scores) but comparable or even somewhat higher basic academic skills (CTBS scores) upon commencement of teacher preparation as compared to their non-teaching or part-time teaching cohorts.

Other related findings less central to the question of the effects of attrition upon the teaching talent pool were: (1) Male and female candidates differed somewhat in their initial academic scores, with 4 of 12 tests favoring the female candidates. (2) Elementary and secondary candidates differed little in their scholastic aptitude and initial academic skills but the secondary candidates did have higher vocabulary scores. (3) The time at which the candidates decided to teach was not found to be related to the candidates' extent of successful transition to teaching, but those candidates deciding to teach in their early years, elementary years as compared to high school or later, tended to have higher scholastic aptitude and academic skills. (4) The candidates' initial degree of assurance about wanting to become teachers was not found to be related to the candidates' ability upon commencement of teacher preparation as measured by the ACT and CTBS; however, the candidates' degree of assurance about teaching interacted statistically with the extent of transition factor, revealing that those candidates initially uncertain about teaching who later became part-time teachers had lower reading comprehension, language expression, and math computations than the other candidates.

In summation, the findings from the present study provided somewhat inconsistent evidence about the impact of attrition upon the quality of the remaining pool of teachers as the candidates made the transition from students to the early years of teaching. If one strictly follows the application of MANOVA procedures relative to the degree of successful transition main effect, one can conclude that attrition during teacher preparation and the transition to the early teaching years has no impact upon the quality of the remaining pool of teachers. However, the identification of several significant and near significant univariate ANOVA main effect and statistical interactions in the present set of data suggest the effects of attrition upon teacher quality may not be that clear cut. These somewhat "suspect" findings suggest that candidates becoming full-time teachers may have somewhat lower aptitude scores but comparable or even higher basic academic scores than their cohorts teaching part-time or not teaching at all. This pattern of somewhat lower aptitude but higher academic skills for candidates teaching as compared to those not teaching appears to be consistent with findings from the National Longitudinal Survey (e.g., Heyns, 1988). Generalizations from the present findings also must be made with caution as all subjects were from a single teacher preparation institution. Furthermore, studies of teacher attrition, to be inclusive, need to also account for those candidates who for whatever reason do not complete teacher preparation. This was not done in the present study although findings from prior research have revealed differences in the academic abilities between persisters and nonpersisters through teacher preparation (Marso & Pigge, 1991; Pigge & Marso, 1992).

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Table 1

MANOVA F's Related to Testing the Differences Between Group Classifications for the 12 Dependent Variables

Group Classification Levels	MANOVA F[a]	p	Decision
Extent of Successful Transition	1.37	.0736	SIG*
Assurance	0.93	.5649	N.S.
Extent x Assurance	1.45	.0094	SIG***
Gender	4.76	.0001	SIG***
Extent x Gender	1.02	.4444	N.S.
Instructional Level	2.00	.0234	SIG**
Extent x Instructional Level	0.97	.5208	N.S.
First Interested	1.26	.1821	N.S.
Extent x First Interested	0.64	.9919	N.S.

[a] Wilks' Lambda

* Significant at .10 > p > .05

** Significant at .04 > p > .01

*** Significant at p < .01

Table 2

Univariate Main Effects and Interaction F Values Comparing the Academic Mean Scores of the Teacher Candidates when Classified by Extent of Successful Transition from Students to Teachers and by Initial Degree of Assurance About Teaching (N = 387)

	Extent of Successful Transition						Degree of Assurance					Extent x Assurance	
Dependent Variable	Part-Time	Full-Time	Not Teach	Not Cert.	F	p	Very Certain	Certain	Uncertain	F	p	F	p
ACT English	18.75	16.36	17.74	19.64	2.46	.0621	18.16	18.41	17.80	0.14	.8732	0.91	.4887
ACT Math	16.64	16.37	17.00	18.26	0.62	.6022	17.47	17.95	15.77	1.20	.3019	0.95	.4603
ACT Soc. Science	18.10	15.75	17.19	20.25	3.21	.0232	18.30	17.96	17.21	0.29	.7458	0.28	.9485
ACT Nat. Science	21.28	18.27	19.65	21.98	2.48	.0605	20.87	20.57	19.44	0.49	.6148	0.36	.9036
ACT Composite	18.79	16.78	18.04	20.21	2.32	.0754	18.82	18.87	17.67	0.47	.6270	0.52	.7946
CTBS Vocabulary	32.37	32.45	34.78	35.42	3.10	.0268	34.41	33.70	33.16	0.69	.5004	1.62	.1406
CTBS Reading Comp.	31.12	32.37	33.95	33.68	2.91	.0342	33.34	32.63	32.36	0.77	.4616	2.42	.0264
CTBS Spelling	21.95	23.21	23.04	22.90	0.84	.4714	22.49	23.09	22.74	0.66	.5180	1.06	.3841
CTBS Lang. Mech.	20.89	21.26	21.38	20.85	0.21	.8912	20.88	21.26	21.14	0.26	.7748	1.48	.1835
CTBS Lang. Expr.	33.87	35.11	35.27	35.87	1.06	.3646	34.90	35.50	34.70	0.52	.5948	2.44	.0249
CTBS Math Comput.	25.01	28.71	27.86	25.61	2.68	.0469	26.06	27.80	26.52	1.65	.1932	3.20	.0045
CTBS Math Concepts	25.70	28.92	27.68	26.75	1.40	.2425	27.32	27.50	26.97	0.06	.9394	1.51	.1745

Table 3

Uniariate Main Effect and Interaction F Values by Gender, Instructional Level, and by When They Were First Interested in Teaching (N = 387)

	Gender				Extent x Gender		Instructional Level				Transition x Level		First Interest Teaching					Extent x Interest	
Dependent Variable	Male	Female	F	p	F	p	Elem.	Sec.	F	p	F	p	Elem.	H.S.	Post H.S.	F	p	F	p
ACT English	16.23	18.78	4.98	.0262	0.71	.5447	18.60	18.18	0.28	.5992	0.23	.8786	19.84	18.39	16.89	3.56	.0293	0.10	.9968
ACT Math	17.35	17.68	0.06	.8071	1.50	.2139	17.27	18.30	1.25	.2648	0.14	.9360	19.29	17.27	16.63	2.55	.0794	0.57	.7524
ACT Soc. Science	19.15	17.97	0.77	.3793	1.14	.3336	17.94	18.67	0.60	.4380	0.09	.9671	19.11	18.05	16.94	1.41	.2451	0.16	.9868
ACT Nat. Science	21.07	20.63	0.11	.7410	2.02	.1102	20.39	21.19	0.73	.3939	0.39	.7637	21.83	20.61	19.40	1.75	.1744	0.19	.9792
ACT Composite	18.61	18.90	0.06	.8120	1.44	.2302	18.69	19.21	0.38	.5363	0.19	.9053	20.11	18.73	17.59	2.41	.0913	0.13	.9931
CTBS Vocabulary	35.71	33.64	3.34	.0683	1.29	.2776	33.41	35.43	6.82	.0094	2.17	.0917	34.48	33.03	35.00	2.74	.0658	0.61	.7237
CTBS Rdg. Comp.	33.28	33.04	0.06	.8030	0.29	.8297	32.77	33.94	3.10	.0789	2.56	.0545	33.68	32.40	33.47	1.75	.1755	0.34	.9161
CTBS Spelling	21.46	23.05	4.64	.0319	0.93	.4280	22.92	23.00	0.02	.8804	1.24	.2966	23.46	22.24	23.28	2.80	.0622	0.78	.5831
CTBS Lang. Mech.	19.58	21.58	7.17	.0078	0.38	.7647	21.36	21.39	0.00	.9564	2.02	.1106	22.37	20.56	21.10	4.59	.0107	0.97	.4431
CTBS Lang. Expr.	33.39	35.67	5.63	.0183	0.10	.9547	35.56	35.23	0.25	.6187	1.67	.1727	36.65	34.52	35.61	4.06	.0181	0.37	.8990
CTBS Math Comput.	28.09	26.96	0.66	.4182	1.08	.3562	26.79	28.30	2.48	.1164	2.28	.0795	27.56	26.60	28.03	0.89	.4103	1.02	.4141
CTBS Math Concepts	29.19	27.02	2.62	.1338	0.94	.4212	27.06	28.43	1.83	.1766	1.56	.1984	28.73	26.70	27.47	1.50	.2247	0.63	.7047

Figure 1

Extent of Successful Transition to Teaching x Assurance About Teaching
Dependent Variable: Reading Comprehension Scores

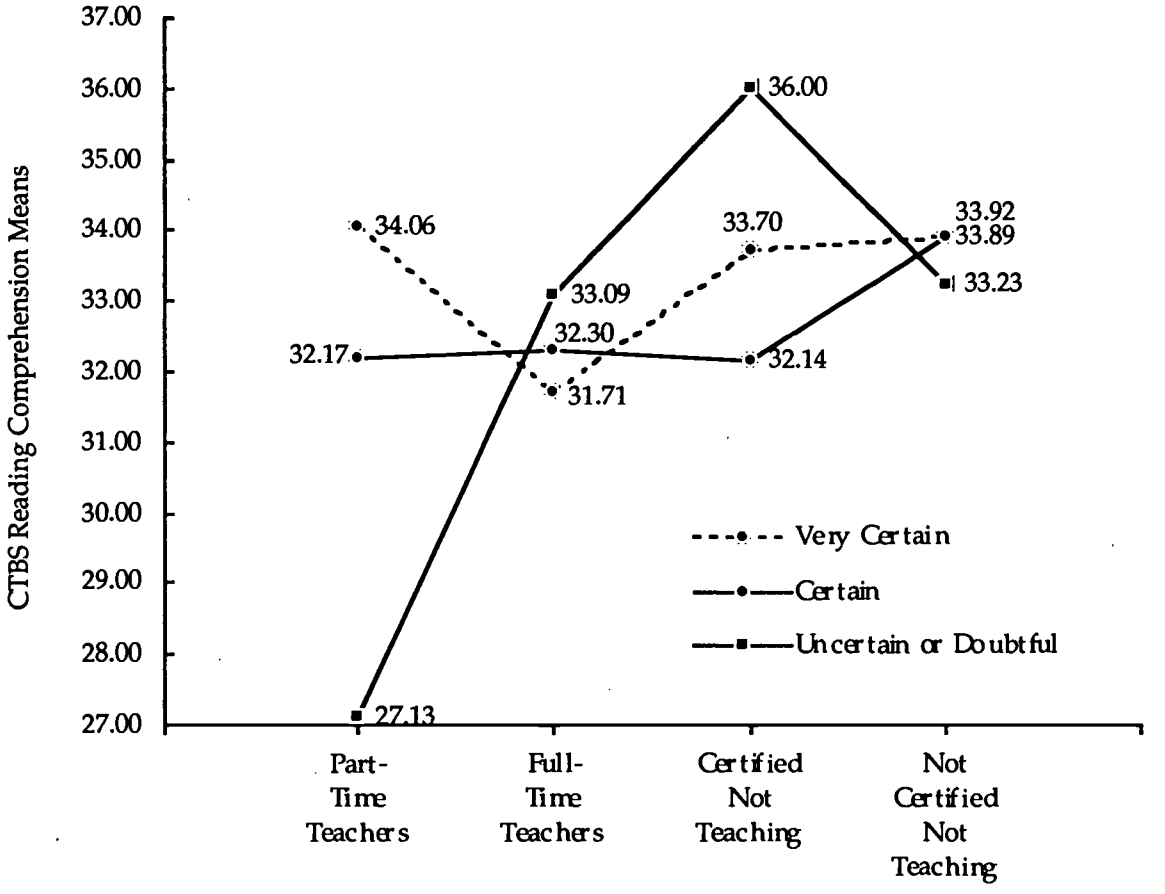
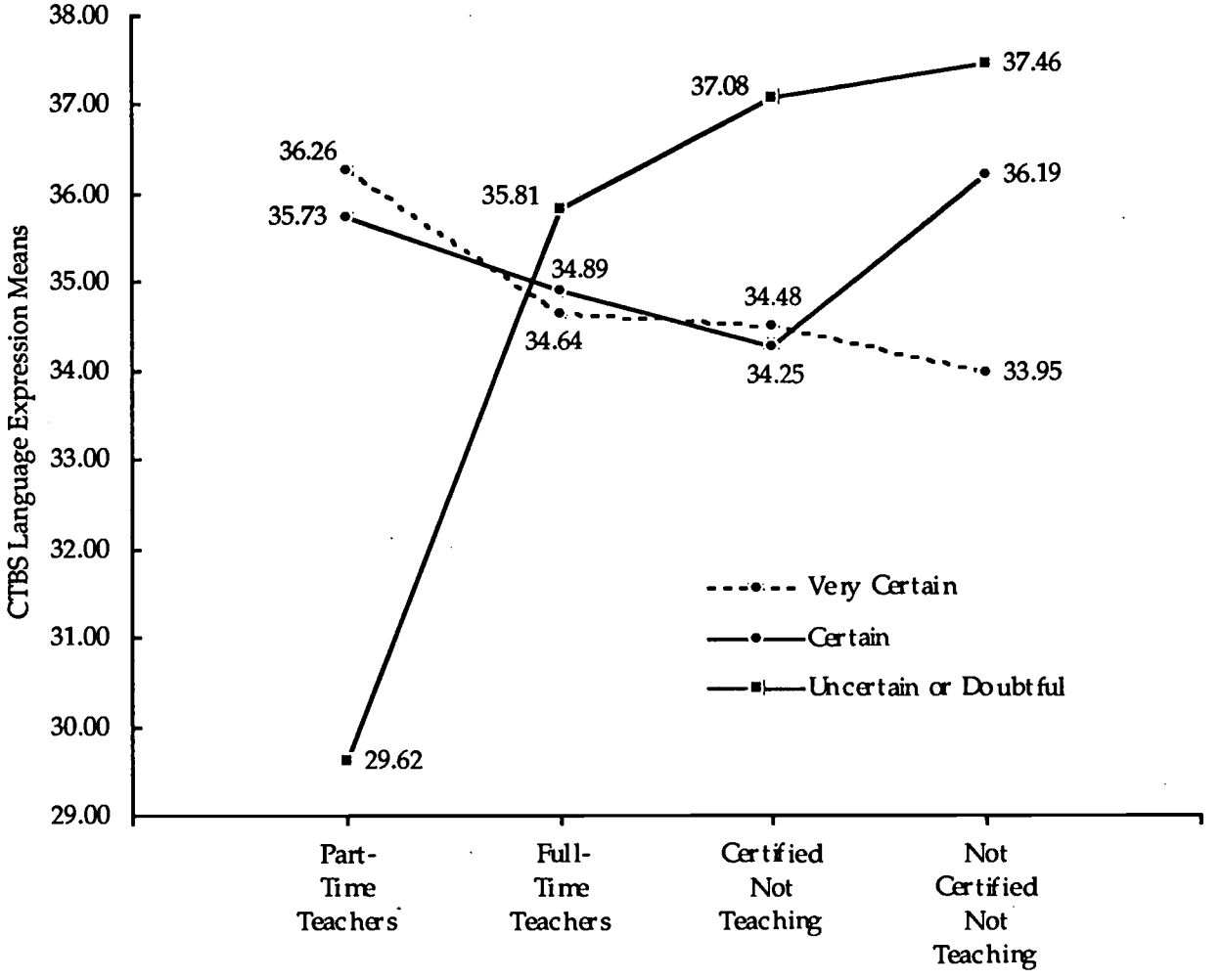


Figure 2

Extent of Successful Transition to Teaching x Assurance About Teaching
Dependent Variable: Language Expression Scores



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