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Validation of the Modern Language Aptitude Test

Stephani C. Sawyer
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To the Graduate Council:

I am submitting herewith a dissertation written by Stephani C. Sawyer entitled "Validation of the Modern Language Aptitude Test." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

R. Steve McCallum, Major Professor

We have read this dissertation and recommend its acceptance:

Sherry Mee Bell, Clara Lee Brown, Dolly Young

Accepted for the Council:

<u>Carolyn R. Hodges</u>

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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VALIDATION OF THE MODERN LANGUAGE APTITUDE TEST

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Stephani Choate Sawyer
August 2008

DEDICATION

I would like to dedicate this dissertation to my parents, Chris Choate and Kathy Henderson; my brother, Josh Choate; my grandparents; all of my family and friends (especially my cohort); and my wonderful husband, Nathan Sawyer, for always providing unconditional love and support, encouraging me through difficult times, and inspiring me to work hard to reach my goals throughout this journey and my whole life. I have been very blessed to have these people in my life.

ACKNOWLEDGEMENTS

ABSTRACT

To determine the utility of the Modern Language Aptitude Test (MLAT; Carroll & Sapon, 1959, 2002) to predict foreign (FL) and native language (NL) learning for foreign language students, it was administered to 347 college students in introductory (100- level) foreign language courses along with measures of reading and reading-related skills (e.g., ND; Nelson-Denny Reading Test; Brown, Fishco, & Hanna, 1993). All correlation coefficients between MLAT and ND scores and FL exam grades are significant at the .001 level except for the MLAT Spelling Clues subtest, which is significant at the .05 level. These correlation coefficients range from .13 to .32. In the context of a stepwise multiple regression, MLAT Number Learning is the strongest and only statistically significant predictor of FL students' exam grades (French, German, and Spanish students combined; $p < .001$). When considering French, German, and Spanish students' subtests separately, none of the MLAT subtest scores significantly predict French course exam scores. MLAT Phonetic Script is the only significant predictor of German students' exam grades ($p < .05$). The MLAT Number Learning subtest predicts significantly Spanish students' exam grades ($p < .01$) and the MLAT Phonetic Script subtest adds an additional 3% of variance in the Spanish students' exam scores ($p < .05$). Results of a multivariate analysis of variance (MANOVA) show the composite means of the three MLAT subtests do not differ between students who claim to have a learning disability and those who do not. The MLAT Spelling Clues subtest significantly predicts FL students' ND Comprehension scores ($p < .001$), and the Phonetic Script subtest adds an additional 3% of variance in the Comprehension scores ($p < .01$). MLAT Spelling Clues is the only significant predictor of FL students' ND Reading Rate scores ($p < .001$).

In general, the MLAT is only modestly to moderately related to relevant FL and NL

performance as defined in this study, and educators should be cautious about making

judgments based on its scores.

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1. INTRODUCTION

Purpose and Rationale

The Modern Language Aptitude Test (MLAT; Carroll & Sapon, 1959, 2002) uses a simulated format (i.e., an artificial foreign language) and English grammar tasks to provide an indicator of an individual's probable degree of success in learning a foreign language. It has been used for years to predict performance in foreign language courses for university students. However, its norms are very dated and circumscribed. Consequently, it may not be optimally useful for modern students. The primary purpose of this study is to determine its utility to predict foreign(FL) and native language (NL) learning for current students. Specific goals are to: (a) determine the relative power of the MLAT's subtests to predict foreign language (i.e., Spanish, French, and German) course exam grades; (b) determine the relative power of the MLAT scores to discriminate students with and without an identified learning disability (LD); and (c) evaluate the MLAT's power to differentiate students who exhibit native language learning limitations from those who do not.

Review of Literature

Assisting students with difficulties in FL learning is challenging for many reasons. Mainly, it is very difficult to determine which students will or will not be able to successfully fulfill the FL requirement. Sparks (2005) points out that:

> neither classification as LD nor the presence of IQ-achievement discrepancies is
> predictive of which students will exhibit FL learning problems, that students
> classified as LD pass college FL courses, that many students classified as LD
> either do not enroll in or take FL courses to completion before they are granted

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course substitutions, that students classified as LD who receive course

substitutions for the FL requirement have native language skills (e.g., reading,

spelling, writing) in the average range or higher, and that students classified as

LD who pass FL courses and fulfill the FL requirement and those who receive

course substitutions do not exhibit differences on IQ and academic achievement

measures (pp. 44-45).

However, the MLAT has a fairly good track record in predicting FL achievement, with

correlations of .40 to .70 between MLAT scores and grades among high-school students,

college students, and young adults (Ayers, Bustamante, & Campana, 1973; Carroll, 1981,

1985; Gajar, 1987; Wesche, Edwards, & Wells, 1982). On the other hand, not all have

found strong correlations. Goodman, Freed, and McManus (1990) reported coefficients

ranging from .15 to .42 using various subtests. Although these results are promising on

the whole, administrators are still struggling with trying to weigh the advisability of using

the MLAT to help make decisions regarding FL substitutions.

Because the predictive validity of the MLAT for students in university settings

has been questioned in the research, it is difficult for administrators to be confident of its

place in decision-making. Even so, many researchers tout its potential and call for local

norms for specific populations (Gajar, 1987; Goodman et al., 1990; Sparks, 2005; Sparks

& Ganschow, 2001). Once these norms are established, administrators can use them to

make predictions about success in foreign language courses in local settings and

determine with more objectivity who should be considered eligible for substitutions or

exemptions.

Another consideration in these decisions is the possibility that certain languages may be better suited for students with difficulties than other languages. It has been suggested that for students with phonological difficulties, a language that relies primarily upon a different rule system, such as Chinese, or upon reading instead of oral pronunciation, such as Latin, might be considered (Fisher, 1986; Ganschow & Sparks, 1987). Similarly, some languages, such as Italian, Spanish, and German are considered to use more transparent (regular) orthographies, which would presumably make them easier to learn (Scott, 2005). However, Ayers et al. (1973) found no significant differences among students in Spanish, French, and German on the MLAT, ACT scores, and college GPA. Therefore, the argument that some languages can be learned with increased ease for students with certain types of learning difficulties is still unresolved.

A variety of abilities thought to be related to foreign language learning ability (i.e., memory, auditory discrimination, and grammatical sensitivity) are reportedly measured by the five MLAT subtests: I – Number Learning (memory, "auditory alertness"); II – Phonetic Script (sound-symbol association ability); III – Spelling Clues (English vocabulary, sound-symbol association ability); IV – Words in Sentences (grammatical structure); and V – Paired Associates (rote memory).

Native Language Predictors of FL Proficiency and Aptitude

In the 1960's, John Carroll and Paul Pimsleur both examined the impact of native language skills on FL learning. Since then, other researchers have questioned the link between various NL skills and their effects on FL learning. For example, research by Humes-Bartlo (1989) indicated that poor FL learners show mild deficits in their NL skills compared to good FL learners. Skehan (1986) reported that children who "make more

rapid progress in their first language tend to do better in foreign language learning at school" (p. 196). Other studies have shown that students with significantly stronger NL skills achieve higher end-of-year FL grades than students with weaker NL skills (Ganschow et al., 1994; Sparks & Ganschow, 1995b).

Evidence from the FL aptitude research generally supports the theory that one's performance on standard measures of NL skill (e.g., reading, vocabulary, group achievement) relates to one's level of FL proficiency (Sparks, Artzer, Javorsky, et al., 1998). Specifically, research seems to indicate that poor auditory ability or phonetic coding has the potential to cause FL learning problems, just as deficits in phonological coding – the ability to take apart and put together the sounds and their representative letters in words – can cause problems in learning to read and write one's NL. Difficulties with phonology and syntax, rather than with semantics, have been found to differentiate good and poor FL learners (Ganschow & Sparks, 1991; Sparks, Ganschow, Javorsky, Pohlman, & Patton, 1992a, 1992b).

Sparks, Patton, Ganschow, Humbach, and Javorsky (2006) examined data collected on 54 elementary school students over a 10-year period to determine which NL measures best predicted FL proficiency and FL aptitude. Eight NL predictor variables were used, including the Woodcock Reading Mastery Test – Revised (WRMT – R) Passage Comprehension subtest (Woodcock, 1987) and the Test of Written Spelling – 2 (TWS-2; Larsen & Hammill, 1986), among others. FL proficiency was measured using the American Council on the Teaching of a Foreign Language (ACTFL) Proficiency Guidelines (1986, 1989) and FL aptitude was measured by the MLAT. Five prediction models were used, and native written language measures were the best predictors of

overall FL proficiency in all five. Measures of cognitive ability and several oral and written language measures administered in elementary school were the best predictors of MLAT scores in the ninth grade. Overall, the results of this study "provide strong support for connections between students' NL skills and subsequent FL proficiency" (p. 152).

In a related study, Ganschow and colleagues (Ganschow, Sparks, Javorsky, Pohlman, & Bishop-Marbury, 1991) compared successful and unsuccessful (petition) college FL learners on measures of intelligence, FL aptitude, native oral and written language, and math. Petition students were those who had been granted exemption from the FL requirement. Assessment measures included the MLAT, Wide Range Achievement Test – Revised (WRAT-R; Jastak & Wilkinson, 1984), and Woodcock-Johnson Psycho-Educational Battery, Part II (WJPB; Woodcock & Johnson, 1977). Mean difference analyses were conducted to determine differences between successful and petition FL learners on each test and test cluster. Most petition students exhibited relative weaknesses in phonological and syntactic (grammatical) areas. Results also showed significant between-group differences on the MLAT total test and all of the subtests, with petition students performing significantly lower.

Stemming from the concept that NL skills influence FL learning, Sparks and Ganschow developed the Linguistic Coding Differences Hypothesis (LCDH; Sparks & Ganschow 1991, 1993, 1995a; Sparks, Ganschow, & Pohlman, 1989). The LCDH suggests that FL learning is built upon native language skills (i.e., phonology/orthography, grammar, and semantics), which serve as the foundation for successful FL learning (Sparks, 1995; Sparks, Artzer, Ganschow, et al., 1998). According

to their research, poor FL learners consistently turn out to be those students with NL

learning differences and/or deficits.

Foreign Language Learners within Special Populations

A relationship between FL learning and dyslexia was first alluded to by Kenneth

Dinklage in 1971 and subsequently explored by others (Carroll, 1990; Spolsky, 1989).

> Dyslexia is a specific learning disability that is presumed to be neurological in
>
> origin. It is characterized by difficulties with accurate and/or fluent word
>
> recognition and by poor spelling and decoding abilities. These difficulties
>
> typically result from a deficit in the phonological component of language that is
>
> often unexpected in relation to other cognitive abilities and the provision of
>
> effective classroom instruction. Secondary consequences may include problems in
>
> reading comprehension and reduced reading experience that can impede growth
>
> of vocabulary and background knowledge (IDA, 2002).

Students with dyslexia often struggle with distinguishing sounds, poor phonemics,

auditory processing, processing speed, as well as other areas.

Although the exact meaning of the term "learning disability" is highly debated,

most people agree on some components of LD, "one of which is the presence of

academic deficits (e.g., in reading, writing, math), which are the most overt

manifestations of underlying information-processing problems" (Kavale, 1993, p. 520).

Some students with LD, particularly those with NL learning problems, are more likely to

have FL learning problems. Gajar's (1987) local norming study discussed earlier was the

first reported study on students identified as having LD in relation to FL aptitude. Her

results showed that students with LD obtained significantly lower scores on all five of the

MLAT subtests compared to students without LD. Others, such as Sparks and his colleagues have included students classified as LD in several studies. One such study compared NL skill, FL aptitude, and FL proficiency of "at-risk" secondary students with and without LD (Sparks, Artzer, Javorsky, et al., 1998). Results showed both groups to have similar cognitive, academic achievement, and FL aptitude profiles and FL learning and proficiency after two years of FL study.

Sparks et al. (1992a) aimed to identify NL deficits in first-year high school FL learners classified as high or low risk based on first-quarter grades, teacher reports, and an author-designed screening instrument. Results indicated significant differences between the low-risk and high-risk groups and the low-risk and LD groups on NL measures of reading, spelling, and written grammar, as well as on all subtest and the total test score of the MLAT. No significant differences were found on any of the MLAT subtests or the Short (subtests III, IV, and V) and Long (all five subtests) Forms between high-risk and LD groups. This suggests that high-risk and students with LD have similar deficits in NL skills.

In another study, Sparks, Philips, Ganschow, and Javorsky (1999b) examined whether university students classified as LD and who had been granted substitutions for the FL requirement would display significant differences when grouped according to selected variables including a score below versus at or above the 25th percentile on the MLAT. The sample's overall mean score on the MLAT was in the below-average range, with scores ranging from poor to above average. Eighty-one percent of the sample scored below the 25th percentile versus at or above the 25th percentile on the MLAT.

Sparks and Javorsky (1999) conducted two studies at two different universities to replicate and compare results to the Sparks, Philips, and Ganschow study (1996). Results from these studies suggested similarities among students classified as LD, including demographics, cognitive ability, academic achievement, and FL aptitude profiles. All participants in both studies were identified as having LD and had received course substitutions for the college FL requirement. Mean scores of participants in both studies were in the below-average range on the MLAT. Sparks and colleagues (Sparks, Philips, Ganschow, & Javorsky, 1999a) also compared students classified as LD and who petitioned for substitutions with students classified as LD who passed FL courses on measures of reading, math, written language, ACT score, and graduating GPA. No significant differences were found between groups when IQ was used as a covariate.

Identification of Students At-risk for Foreign Language Failure

During the 1990's, Sparks, Ganschow, and colleagues conducted a series of studies to test the LCDH. The MLAT has been administered as part of a battery of tests in these studies. Findings showed successful FL learners exhibiting significantly stronger FL aptitude on the MLAT (Ganschow & Sparks, 1991; Ganschow et al., 1994; Sparks, Fluharty, Ganschow, & Little, 1996; Sparks, Ganschow, Artzer, Siebenhar, & Plageman, 1997, Sparks, Artzer, Ganschow, et al., 1998; Sparks et al., 1992a, 1992b). In fact, in the Sparks, Artzer, Ganschow, et al. (1998) study, MLAT scores correlated higher with FL proficiency than any of the NL measures or FL grades. Although these results are promising, more empirical data are needed to support the use of the MLAT in making FL course accommodation or substitution/exemption decisions.

Based on their work, Sparks, Ganschow, and Javorsky (1992) recommended factors that should be considered when diagnosing and accommodating the FL learning difficulties of college students with learning disabilities, including which types of standardized tests should be administered. The authors suggest use of the MLAT with analysis of performance on each subtest as well as total test scores. Descriptions of four "prototypes" of FL learners are presented as examples. The first prototype is a poor FL learner who has weak phonological processing skills but average to strong syntactic and semantic skills. The second prototype is a poor FL learner who has strong phonological processing but weak syntactic and/or semantic skills. The third prototype is a poor FL learner with weak phonological, syntactic, and semantic skills. The remaining prototype has strong phonological, syntactic, and semantic skills and is a strong FL learner. Further, Sparks et al. (1992, 2006) recommend direct and explicit instruction in phonology during FL instruction, a technique that is utilized at one major university, the University of Colorado at Boulder (UC-Boulder).

The UC-Boulder has developed a Foreign Language Modification Program for students with language learning disorders and other at-risk students who are likely to have difficulty learning a foreign language. Two primary measures are considered essential in the identification of at-risk students: extensive language learning history and standardized measures (Downey & Snyder, 2000). Extensive language learning history should include FL learning attempts and failures, and can be obtained through interview or case history format. Standardized tests used at UC-Boulder include the MLAT, Nelson-Denny Reading Test (Brown et al., 1993), and Wide Range Achievement Test – Revised (WRAT-R; Jastak & Wilkinson, 1984). To be considered at-risk, a student is

expected to perform below the 10th percentile on the MLAT and at least one standard deviation below the mean on the WRAT-R Spelling and Reading subtests.

In a somewhat different setting, the Foreign Service Institute (FSI) uses the MLAT as part of their procedures for assignment to FL training. In a study conducted at the FSI by Ehrman (1994), 1000 adult students were administered several measures; the MLAT proved the best predictor of language learning success. Total scores were derived from the total of all five subscales, while Index Scores were created through conversion of the raw Total into a scale ranging between 20 and 80. The best discriminators at all levels of proficiency appear to be Part III and the Total and Index Scores. Parts III, IV, V, Total, and Index scores clearly differentiated the weakest students in both speaking and reading. The strongest speakers were less clearly differentiated. The strongest readers were clearly differentiated by all MLAT parts except Part IV, with the clearest distinction coming from the Index Score. In this study, the Index Score was the most useful predictor, with Part III the strongest of the subtest predictors. Ehrman suggests that researchers "seek normally distributed samples on which to replicate this study [and] begin multiple regression and discriminant analysis to see if MLAT is a better predictor in combination with other variables" (p. 94).

2. STATEMENT OF THE PROBLEM

Instructors and administrators are often faced with difficult decisions when trying to assist students who struggle with learning a foreign language. Some students are able to learn their native or a foreign language with relative ease while others have repeated failures or learn only with great difficultly. Particularly in college settings, educators are interested in assessing FL aptitude in order to predict who will be successful generally because they must make decisions about substitutions or exemptions and/or accommodations and instructional strategies. FL aptitude refers to an empirically developed, operationally defined construct that predicts the extent and rate of classroom FL learning by an individual relative to other individuals (Carroll, 1973, 1981; Carroll & Sapon, 1959).

Carroll's (1973, 1981) factor-analytic studies led to the development of one aptitude measure, the MLAT, which is based on four variables he found to be important for FL learning: phonetic coding, grammatical sensitivity, inductive language learning ability, and rote memory. Similarly, Paul Pimsleur studied FL aptitude and developed a FL aptitude test, the Language Aptitude Battery (LAB; Pimsleur, 1966), though, among commercial FL aptitude test batteries, "the MLAT is the best known and most widely used" (Wesche et al., 1982, p. 130).

Myer and Ganschow (1988) report that two years of language study is a requirement in most colleges and universities for many degree programs. For example, according to the University of Tennessee 2006-2007 Undergraduate Catalog, the General Education requirement is to complete two "Cultures and Civilizations" courses, which includes Intermediate Foreign Language sequences. So, students in the College of Arts

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and Sciences must fulfill a foreign language requirement by completing an intermediate FL sequence or by demonstrating competence on a placement or proficiency exam or by Advanced Placement (AP) or College-Level Examination Program (CLEP) credit. This requirement often proves difficult for many students to complete. When this occurs, substitutions or accommodations may be requested. However, no conclusive evidence about the MLAT is available to assist administrators in making these decisions for this sample. In fact, four specific psychometric and theoretical problems limit use of the MLAT data for recommending course substitutions/waivers of the FL requirement, as discussed by Sparks, Javorsky, and Ganschow (2005). These problems include: (a) outdated test norms; (b) inappropriate conceptualization of the FL aptitude concept; (c) use of a single test score to diagnose a disability or recommend course substitutions; and (d) misuse of the MLAT to diagnose a LD or to classify students with a "disability" for FL learning. Given these limitations, this study was designed to: (a) inform educators regarding its power to predict foreign language (i.e., Spanish, French, and German) course and exam grades; (b) discriminate students with and without an identified learning disability (LD); and (c) differentiate students who exhibit native language learning limitations from those who do not. These goals lead to the following specific research questions.

3. RESEARCH QUESTIONS

1. To what extent are the first three MLAT subtest scores, FL (Spanish, French, and German) exam grades, and native language reading skills (as measured by the Nelson-Denny) related?

2. To what extent do the first three MLAT subtest scores predict foreign language course performance (i.e., average of midterm and final or final exam scores if no midterm was administered) for college students in introductory (100-level) foreign language (Spanish, French, and German) classes?

3. To what extent do the first three MLAT subtest scores differentially predict performance in the various foreign language classes, based on language of study?

4. Is there a difference in performance on the first three MLAT subtests between students who claim to have a learning disability (via demographic survey) and those who have not? That is, do the first three MLAT subtests discriminate students who claim to have a learning disability and those who do not?

5. Can the first three MLAT subtests predict significantly ND reading comprehension scores, a NL measure, for FL students?

6. Can the first three MLAT subtests predict significantly ND reading rate scores, a NL measure, of FL students?

4. METHOD

Participants

Participants included 347 college students in introductory (100- level) foreign language courses at the University of Tennessee. The sample included students enrolled in Spanish, French, and German; FL courses which typically had the highest enrollments during the 2005-06 academic year. These participants ranged in age from approximately 18 to 40, though most were between the ages of 18 and 25 (97%). The sample consisted of both students who have and have not been identified as having one or more learning disabilities, though most had not (88%). Fourteen participants reported that they had been formally identified as having a learning disability while 29 reported they had a learning disability that had not been diagnosed. For the purpose of data analyses, these two groups were combined as a third group who claim to have learning disabilities. Forty-five percent ($n = 156$) of the sample were female, and 51.6% were male (n = 179). Forty-two percent of the participants were freshman, 24.8% sophomores, 15.6% juniors, 5.2% seniors, and 0.3% graduate students. Because of missing data not all individuals were included for every analysis.

Instruments and Measures

    Modern Language Aptitude Test (MLAT)

The MLAT is purported to be a measure of foreign language aptitude. A variety of abilities thought to be related to foreign language learning ability (i.e., memory, auditory discrimination, and grammatical sensitivity) are reportedly measured by the five subtests: I – Number Learning (memory, auditory alertness); II – Phonetic Script (sound-symbol association ability); III – Spelling Clues (English vocabulary, sound-symbol

association ability); IV – Words in Sentences (grammatical structure); and V – Paired Associates (rote memory). Only the first three subtests were administered. A brief description of these three subscales and their administration is shown in Table 1. (All tables appear in the Appendix.)

Both time constraints and previous studies citing equal or better predictive results with the first three subtests were considerations in this decision. For college students, validity coefficients range from .18 - .69 for the complete test (Carroll & Sapon, 1959). The MLAT correlated .67 with the Primary Mental Abilities Test (PMA; Thurstone & Thurstone, 1962), which suggests a strong general intelligence factor operating in the MLAT (Wesche et al., 1982). This correlation also indicates that the MLAT's subtests reflect FL learning abilities which are distinct from the mental abilities measured by the PMA.

Exam Grades

In order to obtain more specific indicators of student mastery of foreign language learning, an average of midterm and final exam (in Spanish and German) and final exam (in French) numerical grades were used as criterion measures. The French courses targeted in this study do not have a midterm exam. FL exams reflect a mix of listening comprehension, vocabulary, grammar, reading skills/comprehension, and composition. In particular, the exams which all Spanish students are administered have the following configuration: listening comprehension (35%), vocabulary (18%), grammar (25%), reading skills/comprehension (10%), and a composition (12%). Overall course grades are considered to be less accurate due to the addition of quiz and participation points, and because letter grades are somewhat gross measures of achievement, numerical grades were used. Due to several factors, including incorrect student identification numbers,

missing grades sheets, and students dropping courses, exam grades were available for 283

students from the original sample.

Nelson-Denny Reading Test (ND)

To obtain information about the validity of the first three subtests of the MLAT,

independent measures of reading and reading-related skills were administered. These

measures include the Nelson-Denny Reading Test (Brown et al., 1993) Comprehension

subtest, which tests silent reading comprehension in a timed test format and a silent

reading rate measure (words read per minute). Empirical support has been generated for

the theory that native language skill serves as the foundation for FL performance

(Ganschow & Sparks, 1991; Ganschow et al., 1991; Ganschow et al., 1994; Humes-

Bartlo, 1989; Skehan, 1986; Sparks, Artzer, Ganschow, et al., 1998; Sparks, Artzer,

Javorsky, et al., 1998; Sparks, Ganschow, Javorsky, Pohlman, & Patton, 1992a, 1992b;

Sparks et al., 2006). The ND is one of the few group administered tests of reading

comprehension and reading rate that has normative data for college age students. In

particular, a measure of reading comprehension was considered useful in the present

study to examine the more communicative style of teaching currently used in FL

learning. There is also some controversy about whether reading rate predicts reading

comprehension, so both measures were administered to examine this aspect of NL

learning. Alternate forms reliability for the ND Comprehension subtest is reported as r =

.81 in the manual (Brown et al., 1993). The ND subtests are described in Table 2.

Procedures

The first three subtests of the MLAT, the measures of reading skills (from the

Nelson-Denny), and a brief demographic questionnaire were administered by the primary

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investigator and other trained graduate students in School Psychology to specific sections of students from French, Spanish, and German 100-level classes spring semester, 2007. The tests were administered in counterbalanced order. Administration of the MLAT subtests and the reading tests took approximately two class periods or one and a half hours in sessions outside of class. In addition, midterm and final exam grades were collected from instructors and averaged (for Spanish and German) and final exam grades only for French (no midterm exam was given); student identity remained confidential and procedures conformed to guidelines for the rights of human subjects at the University of Tennessee. A procedural integrity checklist was used to ensure uniform procedures. The tests administrators used the checklist to determine if procedures were uniform across testing sessions and implemented as designed. Procedural integrity was 100%. A second investigator, who was a school psychology doctoral candidate, also scored 16% of the tests (MLAT and ND) in order to assess interrater consistency. The number of tests that were scored the same by both scorers was divided by the total number of tests, yielding 95% agreement. Only one test was scored differently.

5. RESULTS

Research questions were designed to address the relationship among the first three MLAT subtests, FL exam grades, and ND comprehension and reading rate subtests, the utility of the first three MLAT subtests to predict FL exam scores and measures of native language learning (i.e., ND scores) and the power of the MLAT scores to discriminate students who claim to have a learning disability (LD) from those who do not. For the ND, scale scores which have a mean of 200 and a standard deviation of 25 are reported. Descriptive statistics for the three MLAT subtests, exam grades, and the Nelson-Denny subtests are listed in Tables 3, 4, 5, and 6 for the FL students combined and independently (i.e., French, German, and Spanish).

Relationships between Exam Grades, MLAT Subtests, and Nelson-Denny Subtests

Correlation coefficients showing the relationships among MLAT scores, exam grades, and Nelson-Denny scores appear in Table 7. According to Cohen (1988), a correlation of at least 0.5 is large, 0.3 is moderate, and 0.1 is small. All correlation coefficients between exam grades and the other five measures (MLAT and ND scores) are significant at the .001 level except for the MLAT Spelling Clues subtest, which is significant at the .05 level. These correlation coefficients range from .13 to .32, with the highest correlation occurring between the exam grade and the MLAT Number Learning subtest. The ND Comprehension ($r(228) = .28$, $p < .001$) and Reading rate ($r(225) = .25$, $p < .001$) correlations with exam grades are significant, but considered modest.

The highest of all the correlations occurred between the Nelson-Denny Comprehension and Reading Rate standard scores, ($r(274) = .41$, $p < .001$). As expected,

students who have a high Reading Rate score tend to score high on Comprehension. A moderate correlation was found between the MLAT Phonetic Script and Number Learning subtest scores ($r(300) = .39$, $p < .001$). MLAT Spelling Clues and ND Comprehension were also moderately positively correlated ($r(243) = .35$, $p < .001$).

Do MLAT Subtest Scores Predict FL Performance?

A stepwise multiple regression analysis was used to examine the relative predictive relationship between MLAT subtest scores and FL students' exam scores (combined across the three languages). FL students' exam scores served as the dependent variable; predictor variables included three MLAT subtest scores: MLAT Number Learning, MLAT Phonetic Script, and MLAT Spelling Clues. Each was entered into the regression equation in a stepwise fashion with the strongest predictor entered first. About 10% of the variation in the exam grades is explained by the regression model; only the MLAT Number Learning subtest predicted significantly ($R^2 = .10$; $p < .001$). The MLAT Phonetic Script and Spelling Clues subtests failed to add significant predictive capability and did not enter into the equation (see Table 8).

Do MLAT Subtest Scores Differentially Predict FL Performance Based on Language of Study?

A stepwise multiple regression was also calculated to determine the extent to which the first three MLAT scores predicted exam grades in the FL courses (based on the language of study). None of the MLAT subtest scores predict French students' exam scores significantly. On the other hand, another multiple regression analysis revealed that the MLAT Phonetic Script subtest predicts significantly exam grades for German students. Thirteen percent of the variance in exam grades is predicted by this subtest ($R^2 =$

19

.13; $p < .05$). Neither the MLAT Number Learning nor Spelling Clues subtests added to the predictive equation ($p > .05$). For Spanish students, two MLAT subtests predicted significantly. Since the MLAT Number Learning subtest predicts the largest amount of unique variance in FL grades, it entered into the regression equation first, followed by MLAT Phonetic Script. About 13% of the variation in exam grades can be explained by the regression model using these two predictors, with MLAT Phonetic Script predicting 3% of the variance in exam grades ($p < .05$) beyond the 10% predicted by MLAT Number Learning ($p < .01$).

Do MLAT Subtest Scores Discriminate Between Students with Learning Disabilities and Those Without?

A one-way multivariate analysis of variance (MANOVA) was calculated to examine the utility of the first three MLAT subtests to discriminate students who claim to have a learning disability from those who do not. No significant mean difference was found (*Wilks' Lambda* $(3, 287) = .993, p > .05$). The MLAT subtests' means, taken as a composite, do not differentiate students who claim to have a learning disability from those who do not. For the comparison using the MLAT Number Learning subtest, the effect size is -.14 (Cohen's *d*). For the comparison using the MLAT Phonetic Script subtest, the effect size is -.14. Finally, for the comparison using the MLAT Spelling Clues subtest, the effect size is .01.

Can MLAT Subtest Scores Predict Reading Comprehension Scores?

To determine if the first three MLAT subtests can predict comprehension skills as defined by the Nelson-Denny Reading Test (Brown et al., 1993) for FL students, another stepwise multiple regression was calculated. Only two of the three MLAT subtests,

MLAT Number Learning and MLAT Phonetic Script, were powerful enough to enter into the regression equation in a stepwise fashion; MLAT Spelling Clues subtest scores entered first, followed by Phonetic Script. About 15% of the variation in the Comprehension scores can be explained by the regression model using these two predictors, with MLAT Phonetic Script predicting 2% of exam variance ($p < .01$) beyond the 13% predicted by MLAT Spelling Clues ($p < .01$; see Table 10).

Can MLAT Subtest Scores Predict Reading Rate Scores?

To determine if the first three MLAT subtests can discriminate students who exhibit weak reading rate skills as defined by the Nelson-Denny Reading Test (Brown et al., 1993), a final stepwise multiple regression was calculated. Only one of the three MLAT subtest scores MLAT was powerful enough to enter into the regression equation. About 9% of the variation in the Reading Rate scores is predicted by the MLAT Spelling Clues subtest ($R^2 = .09$; $p < .001$). The MLAT Number Learning and Phonetic Script subtests failed to add significant predictive capability and did not enter into the equation (see Table 11).

6. DISCUSSION

The use of the MLAT as a decision-making tool for universities when dealing with foreign language waivers/substitutions has been debated in the literature. The purpose of the present study is to add to the literature by examining the relationship of the first three subtests of the MLAT to NL and FL performance. First, using zero-order correlations coefficients the relationship among the MLAT and NL and FL variables was examined, followed by multiple regression analyses to determine the ability of the MLAT measures to predict FL exam grades. Then, results from additional multivariate analyses (i.e., a MANOVA) were obtained to determine the MLAT's ability to explain NL learning; the composite mean MLAT score of students who claim to have a learning disability was compared to the mean of those who do not. Finally, the ability of the MLAT to predict NL reading rate and comprehension scores from the ND was determined.

Are MLAT scores related to NL and FL performance?

All correlation coefficients between MLAT and ND scores and FL exam grades are statistically significant, though all were modest to moderate. So, there are systematic relationships. The MLAT *is* related to native and FL learning, though not strongly (r values range from .13 to .32). Although correlation coefficients ranging between .40 to .70 between MLAT scores and FL grades among high-school students, college students, and young adults have been found in some previous research (Ayers et al., 1973; Carroll, 1981, 1985; Gajar, 1987; Wesche et al., 1982), this study produced results more similar to those found by Goodman and colleagues (1990); they reported coefficients ranging from .15 to .42 between various MLAT subtests and FL grades. The studies that report

higher correlations between MLAT scores and grades used the full MLAT while the Goodman et al. and present study did not. In addition, studies producing stronger relationships are older and their results were obtained from comparing their participants to those from the standardization sample gathered between 15 and 29 years before. On the other hand, the Goodman et al. study compared their participants to standardization data 32 years old. And, of course the current data were collected 49 years after the original MLAT standardization were obtained.

Importantly, in the current study the MLAT Number Learning subtest is the strongest predictor of FL students' exam grades (French, German, and Spanish combined). This subtest is described in the MLAT manual as having "a fairly large specific variance, which one might guess to be a special 'auditory alertness' factor which would play a role in auditory comprehension of a foreign language" (Carroll & Sapon, 2002, p. 3). With the trend in FL instruction moving to a more communication-based (rather than a grammar-based) mode, this type of skill may be more important.

Although all but one correlation between MLAT and ND subtests were significant, the MLAT Spelling Clues subtest was most strongly correlated to both NL language measures: ND Comprehension and Reading Rate. The MLAT Spelling Clues subtest "depend(s) to some extent on the student's English vocabulary knowledge" (Carroll & Sapon, 2002, p. 3). Therefore, it stands to reason that students who score higher on this subtest are better readers in their NL and would, consequently, have higher reading rate and comprehension scores on NL measures.

Finally, the coefficients expressing these relationships may be somewhat limited by the lack of variability in FL exam grades. The distribution, with a mean of 88

(standard deviation of 12), is not normally distributed and somewhat steep. This "restricted range" characteristic limits somewhat the magnitude of the coefficients.

Does the MLAT Predict FL Performance?

Although Ayers et al. (1973) found no significant differences among students in Spanish, French, and German on the MLAT, the present study suggests it may predict Spanish better than the other two languages. Stepwise multiple regression analyses were conducted for each language (French, German, and Spanish) individually. None of the MLAT subtest scores predict French course exam scores. The MLAT Phonetic Script subtest is the only significant predictor of German students' exam grades. However, both the MLAT Number Learning and Phonetic Script subtests significantly predict Spanish students' exam grades. Apparently these two subtests are more related to either the Spanish language or instruction than they are to French and German (language and instruction). Interestingly, these two subtests are both measures of memory to some extent. Perhaps there is more memorization required in German than French, and more in Spanish than either German or French.

Does the MLAT Predict NL Performance?

Unlike Gajar's (1987) study, which found that students identified as having LD obtained significantly lower scores on all five of the MLAT subtests compared to students without LD, the composite MLAT subtest means did not discriminate between students who claim to have a learning disability and those who do not. Perhaps there is a difference in the ability of the students across the two studies (e.g., the students in the current study may be more capable than were those in the Gajar study). Most of the students in current study identified themselves as freshman and sophomore, and the

entering American College Test (ACT) scores and GPA of these students are approximately 26 and 3.5, respectively. Since Gajar's study took place 20 years ago, it is possible that the criteria for admission to the university may have been less stringent than the standards for admission today.

As is apparent from the literature the construct of LD is "messy" (Sparks, 2005). That is, not all professionals define a learning disability the same way, not all those identified as LD followed the same diagnostic procedures, and those identified may have very different academic and cognitive strengths and weaknesses. Sparks, Artzer, Javorsky, et al. (1998) point out that the field lacks a consistent, empirically validated, operational definition of what an LD truly is, including what criteria are used to give a designation of LD. So, those identified in this study may be different in many ways that those identified in other studies. Finally, this study employed a very limited operationalization of LD. That is, the designation of LD was based only on self-report and not verified by official documentation.

On a more molecular level, the MLAT Spelling Clues and Phonetic Script subtests are the strongest predictors of FL students' ND comprehension scores. And, the MLAT Spelling Clues subtest is the strongest predictor of FL students' Reading Rate scores. These ND scores operationalize NL ability for this study and are significantly correlated with FL exam grades. These results support previous researchers' (Ganschow et al., 1994; Humes-Bartlo, 1989; Skehan, 1986; Sparks, Artzer, Ganschow, et al., 1998; Sparks, Artzer, Javorsky, et al., 1998; Sparks & Ganschow, 1995b; Sparks, Patton, Ganschow, Humbach, & Javorksy, 2006) suggestions that there are strong connections between students' NL skills and subsequent FL proficiency. Apparently, poor auditory

processing and limited working memory has the potential to cause FL learning problems

(Sparks, Ganschow, & Javorsky, 2000), just as these deficits cause problems in learning

to read and write one's NL (Bell, McCallum, & Cox, 2003). In fact, difficulties with

phonology and syntax have been found to differentiate good and poor FL learners

(Ganschow & Sparks, 1991; Sparks et al., 1992a, 1992b).

Summary and Implications

As Sparks (2005) points out, it is very difficult to determine which students will

or will not be able to successfully fulfill the FL requirement. These results add to the

literature that can assist those in the position of decision-making. Relationships among

the MLAT and NL and FL learning of college students engaged in learning a foreign

language are significant generally, but only modest to moderate. So, the MLAT will add

to educators' ability to predict FL success, but only in a limited manner. For example, if

specific predictive equations are created from these data, the predictions will be

characterized (and limited) by a relatively large confidence band. Of interest, the most

powerful subtest in predicting FL performance appears to be Number Learning.

Consequently, creation of a separate predictive equation using this subtest may be most

efficient.

Differences, as well as similarities, in results can be explained to some degree by

examination of the participants and measures used in previous research. Table 12

provides specific information regarding points of comparison and contrast of previous

studies involving the MLAT and FL learning. Elements in Table 1 guided the discussion

presented previously.

Limitations and Future Research

Several limitations exist. The limited ability of the MLAT to predict FL proficiency in this study may in part be related to the operationalization of FL proficiency – exam grades. Exam grades provide only one operationalization of proficiency, and there is little variability in this particular distribution, i.e., its range is somewhat restricted.

In addition, the relatively weak predictive ability of the MLAT may be a result of current trends in FL instruction (i.e., reduced emphasis on grammar, phonetic, and spelling skills and heightened emphasis on communication and utilitarian aspects of the FL). When it was developed over 50 years ago there was a stronger focus on grammar in FL instruction, with a corresponding emphasis on phonics and sound-symbol relationships. Consequently, the MLAT may overemphasize those skills. The skills measured by the MLAT are now considered necessary but not sufficient to have FL proficiency.

In this study the ND was used to operationalize NL learning. Obviously, these data are limited. In the future researchers will benefit from investigating more inclusive operationalizations of NL skills.

Finally, generalizability is limited. These data come from one geographical region and from a large Carnegie I, Research Intensive university. A more diverse participant pool is desirable.

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APPENDIX

Table 1

Modern Language Aptitude Test (MLAT) Subtests

Subtest Title	Description	Example
Part I. Number Learning	This subtest involves short-term memory and "auditory alertness" as examinees demonstrate the ability to learn a "new" language: the names of numbers that are introduced via CD (ex: 1 = rad).	Examinee is presented numbers of a made-up language. The examinee then fills in blanks with the number for each place: hundreds (100-400), tens (0-40), and ones (0-4) when hearing them presented rapidly from the CD.
Part II. Phonetic Script	This subtest requires the ability to learn the correspondence between orthographic symbols and specific sounds and measures memory for speech sounds. This subtest is also presented via CD.	Examinee listens to a sequence of syllables (with no meaning in English) presented via CD while looking at their graphemic representations. The examinee is expected to associate particular sound with particular letters. Four syllables are shown for each item and the examinee selects the syllable that has been presented via CD.
Part III. Spelling Clues	In this subtest, an English word is presented visually in the booklet in a very non-standard spelling, and the examinee must select the correct synonym. Vocabulary items are progressively more difficult. It measures sound-symbol association and requires knowledge of English vocabulary.	Examinee reads English words presented as abbreviated spelling (e.g., luv) and then selects the one word (out of a group of five) that corresponds most closely in meaning (e.g., carry, exist, affection, wash, spy).

Table 2

Nelson-Denny (ND) Subtests

Subtest Title	Description
Comprehension and Reading Rate	Contains seven reading passages and a total of 38 questions, each with five answer choices. There is a 20-minute time limit, with the first minute being used to determine reading rate.

Table 3

Descriptive Statistics for the Modern Language Aptitude Test (MLAT) subtests, exam

grades, and Nelson-Denny Reading Test (ND) for the Total Sample

	N	Mean	Standard Deviation	Range
MLAT Number Learning	302	33.56	8.59	0-45
MLAT Phonetic Script	302	23.37	4.02	0-30
MLAT Spelling Clues	302	16.26	7.16	0-50
Exam Grade	283	80.71	12.32	0-100
Nelson-Denny Reading Rate (WPM)	276	199.61	23.49	
Nelson-Denny Comprehension	279	219.38	19.38	0-38

Note. WPM = Words per minute.

Table 4

Descriptive Statistics for the Modern Language Aptitude Test (MLAT) subtests, exam

grades, and Nelson-Denny Reading Test (ND) for the French Student Sample

	N	Mean	Standard Deviation
MLAT Number Learning	71	35.00	7.40
MLAT Phonetic Script	71	23.10	3.98
MLAT Spelling Clues	71	15.99	7.19
Exam Grade	63	87.83	12.16
Nelson-Denny Reading Rate (WPM)	71	204.25	28.95
Nelson-Denny Comprehension	72	220.64	20.04

Note. WPM = Words per minute.

Table 5

Descriptive Statistics for the Modern Language Aptitude Test (MLAT) subtests, exam grades, and Nelson-Denny Reading Test (ND) for the German Student Sample

	N	Mean	Standard Deviation
MLAT Number Learning	42	34.12	9.63
MLAT Phonetic Script	42	24.02	5.02
MLAT Spelling Clues	42	16.33	7.57
Exam Grade	36	80.97	9.87
Nelson-Denny Reading Rate (WPM)	40	197.70	21.20
Nelson-Denny Comprehension	41	221.37	20.66

Note. WPM = Words per minute.

Table 6

Descriptive Statistics for the Modern Language Aptitude Test (MLAT) subtests, exam

grades, and Nelson-Denny Reading Test (ND) for the Spanish Student Sample

	N	Mean	Standard Deviation
MLAT Number Learning	187	32.84	8.75
MLAT Phonetic Script	187	23.38	3.56
MLAT Spelling Clues	187	16.42	7.09
Exam Grade	184	78.22	11.89
Nelson-Denny Reading Rate (WPM)	161	197.83	20.55
Nelson-Denny Comprehension	162	218.25	18.98

Note. WPM = Words per minute.

Table 7

Zero-Order Pearson Correlation Coefficients between Exam Grades, Modern Language

Aptitude Test (MLAT) Subtests, and Nelson-Denny Reading Test Subtests

	1	2	3	4	5	6
1. Exam Grade						
2. MLAT Number Learning	.32**					
3. MLAT Phonetic Script	.20**	.39**				
4. MLAT Spelling Clues	.13*	.03	.06			
5. Nelson-Denny Comprehension	.28**	.18**	.21**	.35**		
6. Nelson-Denny Reading Rate	.25**	.13*	-.02	.30**	.41**	

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 8

Prediction of Foreign Language Students' Exam Scores from Modern Language Aptitude

Test (MLAT) Subtest Scores

Factor	R	R^2	$R^2 adj.$	F	$p <$
MLAT Number Learning	.32	.10	.10	29.00	.001

Note. adj. = adjusted; *p < .05, 2-tailed; **p < .01, 2-tailed.

Table 9

Prediction of German, and Spanish Students' Exam Scores from Modern Language

Aptitude Test (MLAT) Subtest Scores

	German					
	R	R^2	$R^2 adj.$	$R^2 \Delta$	F	$p <$
MLAT Phonetic Script	.37	.13*	.11		4.91	.05

	Spanish					
	R	R^2	$R^2 adj.$	$R^2 \Delta$	F	$p <$
MLAT Number Learning	.32	.10**	.10		18.99	.01
MLAT Phonetic Script	.36	.13*	.12	.03	12.07	.05

Note. adj. = adjusted; *p < .05, 2-tailed; **p < .01, 2-tailed.

Table 10

Prediction of Foreign Language Students' Nelson-Denny Reading Test Comprehension Scores from Modern Language Aptitude Test (MLAT) Subtest Scores

Factor	R	R^2	$R^2 adj.$	F	$p <$
MLAT Spelling Clues	.35	.13**	.12	34.88	.001
MLAT Phonetic Script	.39	.15**	.14	21.55	.01

Note. adj. = adjusted; *p < .05, 2-tailed; **p < .01, 2-tailed.

Table 11

Prediction of Foreign Language Students' Nelson-Denny Reading Test Reading Rate

Scores from Modern Language Aptitude Test (MLAT) Subtest Scores

Factor	R	R^2	R^2 adj.	F	$p <$
MLAT Spelling Clues	.30	.09**	.09	23.91	.001

Note. adj. = adjusted; *p < .05, 2-tailed; **p < .01, 2-tailed.

Table 12

Research on the Modern Language Aptitude Test (MLAT) and Foreign Language (FL) Learning

Researcher(s)	Population	Measures	Comments
Ayers, Bustamante, & Campana (1973)	224 beginning FL students in French, German, or Spanish at Tennessee Technological University	MLAT Long Form and Short Form, American College Test (ACT), college grade point average, and language grade	No significant differences among students in the three languages. All MLAT subtests and Total MLAT scores were significantly correlated to language grades at the .01 level except for Phonetic Script, which was significant at the .05 level.
Ehrman (1994)	343 long-term (i.e., 16 weeks or above) intensive language training students at the Foreign Service Institute (FSI) with a mean age of 37	MLAT Long Form, an index score specific to FSI, end-of-training proficiency tests	Correlations of MLAT index score with end-of training proficiency ratings: All languages: $r = .44$ Western European languages: $r = .52$ Swahili, Indonesian, Malay, Eastern European and non-Western: $r = .34$ Arabic, Chinese, Japanese, Korean: $r = .47$

Researcher(s)	Population	Measures	Comments
Gajar (1987)	All regular students enrolled in introductory French, German, and Spanish classes at The Pennsylvania State University (n = 244); mean age of less than 21 years	MLAT Long Form, FL course final grades (included participation, homework, quizzes, midterm, and final exams)	Stepwise regression on MLAT subtest scores for grade: Words in Sentences: $r = .42$; $p < .001$ Paired Associates: $r = .42$; $p < .17$
Ganschow, Sparks, Anderson, Javorsky, Skinner, & Patton (1994)	36 college students in introductory Spanish classes at a medium-sized Midwestern university	MLAT Long Form, ND (Comprehension Subtest), Test of Language Competence-Expanded Edition, WRAT-R, WJPEB, WRMT-R, and a writing sample	MLAT correlated with Nelson Denny: $r = .55$
Ganschow, Sparks, Javorsky, Pohlman, & Bishop-Marbury (1991)	30 juniors and seniors attending three moderate-sized Midwestern universities with a mean age of 22; fifteen were "successful" FL learners, and 15 were "unsuccessful"	WAIS-R, WJPEB, MLAT Long Form and Short Form, Goldman-Fristoe, Woodcock Sound Blending and Spelling of Sounds subtests, WRAT-R Spelling subtest, and a 15-minute writing sample	Comparison of group means showed significant differences between the "successful" and "unsuccessful" FL learner groups on the total MLAT and all of the subtests

Researcher(s)	Population	Measures	Comments
Goodman, Freed, & McManus (1990)	587 introductory French, Spanish, and German at the University of Pennsylvania	MLAT Long and Short Forms, SAT scores, and FL course grades (fall and spring semesters)	Significant correlation (< .05) between the MLAT and final grades (first semester only), but it only explained 3% of the variance
Sparks, Artzer, Ganschow, Siebenhar, Plageman, & Patton (1998)	Study 1 - 60 females in second-year Spanish, French, and German courses at a single-sex high school Study 2 - 36 tenth grade students in same FL courses as Study 1 at a large, middle-class, suburban public high school 3 groups: HIGH group – mean score on the FL total test was +1.00 or more SD above the mean; AVG group - mean score was .99 standard SD above the mean to .99 below the mean; LOW group - mean score was -1.00 or more SD below the mean	Study 1 – HSPT TTS, MLAT Long Form, ND, PPVT-R, a Phoneme Deletion task, WRAT-R Spelling subtest, WRMT-R Basic Skills Cluster, language grade from 8th-grade English class, and FL proficiency measures developed by the author Study 2 - Same measures as Study 1 except: ITBS-Total Test Score instead of HSPT TTS; ITBS-Reading Comprehension subtest instead of ND; and a Pig Latin test instead of the Phoneme Deletion task	Study 1 – significant differences found between the high proficiency (HIGH) and low proficiency (LOW) groups on the MLAT Study 2 - significant differences found between the HIGH and LOW groups on the MLAT and between the average proficiency (AVG) and LOW groups

Researcher(s)	Population	Measures	Comments
Sparks, Artzer, Javorsky, Patton, Ganschow, Miller, & Hordubay (1998)	Study 1 – 39 high school females attending three different, private, single-sex, college-preparatory high schools in the Midwest and on the East Coast and enrolled in Spanish 27 students in learning disabled (LD) Group and 12 students in At-Risk (AR) Group Study 2 – 25 of the students in Study 1 who had been classified as LD according to private or public school diagnostic evaluations were divided into two groups: 8 in the discrepancy group (had IQ/achievement discrepancy) and 17 in the no discrepancy group	Both Studies – WRAT-R Spelling subtest, LAC, WRMT-R Basic Skills Cluster, ND, PPVT-R, WJPEB Memory Cluster, MLAT Long Form, WJPEB Brief Cognitive Ability Cluster, FL proficiency measures developed by the author, and the Test de Vocabulario en Imagenes, Peabody	Total population had participated in related study by present authors Study 1 – both LD and AR groups scored higher on the MLAT Long Form in the first posttest than in the pretest or the second posttest No differences between students classified and not classified as LD on Pretest, Posttest 1, and Posttest 2 measures of NL skill and FL aptitude Students classifieds as LD became as proficient in an FL as AR students not classified as LD

Researcher(s)	Population	Measures	Comments
Sparks, Fluharty, Ganschow, & Little (1996)	27 students enrolled in first-year Latin classes at two suburban public high schools in Cincinnati, OH were divided into two groups: 11 in the Non Learning Disabled (NLD) group, eight in the Learning Disabled-Multisensory Structured Language (LD-MSL) group, and eight in the Learning Disabled-No Multisensory Structured Language (LD-NO/MSL) group	LAC, a Phoneme Deletion task, WRAT-R Spelling subtest, WRMT-R Basic Skills Cluster, writing sample, ND, PPVT-R, MLAT Long Form, WJPEB	Pre-Post test comparisons between groups showed significant gains on the MLAT Significant pre- and post-test differences between the NLD and other two groups favoring the NLD group were found on the MLAT No significant pre- or post-test differences were found between the LD/MSL and LD/NO-MSL groups on any of the ten testing measures
Sparks, Ganschow, Javorsky, Pohlman, & Patton (1992a)	65 high school students enrolled in first-semester Spanish, German, Latin, French, Japanese, and Russian courses 2 groups: high (HR) and low risk (LR) learners	Boston Naming Test, LAC, MLAT Long and Short Form scores, WRAT-R, WJPEB Reading Cluster and Written Language Cluster	Comparisons of means on the MLAT showed significant differences between the HR and LR groups on both the Short and Long Forms and all five subtests

Researcher(s)	Population	Measures	Comments
Sparks, Ganschow, Javorsky, Pohlman, & Patton (1992b)	80 high school students enrolled in first-semester Spanish, German, French, Latin, Russian, and Japanese courses 2 groups: high (HR) and low risk (LR) learners 15 students identified as LD included	Boston Naming Test, LAC, MLAT Long and Short Form scores, WRAT-R, WJPEB Reading Cluster, Written Language Cluster, and Brief Scale Cognitive Ability Cluster	Significant differences were found between LR and HR and LR and LD groups on MLAT Short and Long Forms and all five subtests Significant difference was found between HR and LD groups on MLAT Long Form only
Sparks & Javorsky (1999)	Study 1 – 42 individuals (27 male, 15 female) classified as LD who had enrolled in and graduated from a large eastern university Study 2 – 128 students, group from Study 1 plus an additional 86 students from another university All participants had been permitted to substitute courses for the university's FL requirement	Study 1 – WISC-R or WAIS-R, at least one standardized measure of academic achievement, and MLAT Study 2 – same as Study 1 plus ACT/SAT scores	Total group's mean score on MLAT Long Form was in below-average range ($M = 80.2$ and 80.8, respectively)

Researcher(s)	Population	Measures	Comments
Sparks, Patton, Ganschow, Humbach, & Javorsky (2006)	54 students at a large, middle class, rural public school district in the Midwest who had completed two years of Spanish, French, or German courses in the ninth and 10th grades	FL proficiency measures developed by authors, MLAT, WRMT-R, Test of Written Spelling-2, Formal Reading Inventory, PPVT-R, LAC, Test of Reading Readiness, Test of Cognitive Skills, and WRMT-R Passage Comprehension Subtest, alternate form	No significant differences among the three groups (Spanish, French, and German) on any of the predictor and outcome measures. Five prediction models were created and the measure of cognitive ability and several oral and written language measures administered in elementary school were the best predictors of MLAT scores in ninth grade
Sparks, Philips, Ganschow, & Javorsky (1999)	86 college students with LD at a medium-sized university in the Midwest who had petitioned for and received course substitutions for the university's FL requirement	MLAT, standardized test of intelligence, standardized test of achievement, ACT/SAT scores, graduating college GPA, and college FL GPA	The total sample's mean MLAT score was in the below-average range ($M = 81$). 48 students scored below the 25th percentile on the MLAT
Wesche, Edwards, & Wells (1982)	793 English-speaking Canadian public servants at various stages of intensive French language training with a mean age of 37	MLAT and adult version of Primary Mental Abilities test	Correlation between MLAT and PMA: $r = .67$ with a shared variance of 45%

Note: ND = Nelson-Denny Reading Test; WJPEB = Woodcock-Johnson Psycho-Educational Battery; WRMT-R = Woodcock Reading Mastery Test-Revised WRAT-R = Wide Range Achievement Test-Revised; WAIS-R = Wechsler Adult Intelligence Scale-Revised; HSPT TTS = High School Placement Test Total Test Score; PPVT-R = Peabody Picture Vocabulary Test-Revised; ITBS = IOWA Tests of Basic Skills; LAC = Lindamood Auditory Conceptualization Test; WISC-R = Wechsler Intelligence Scale for Children-Revised

VITA

Stephani Choate Sawyer was born in Nashville, TN on December 19, 1979. She graduated from East Robertson High School in 1998. From there, she attended college at the University of Tennessee, Knoxville where she majored in Psychology and minored in English. After earning a Bachelor of Arts degree from UT, she continued there with her work in School Psychology.

Stephani is currently pursuing her doctorate in Education at the University of Tennessee, Knoxville and happily married to her husband, Nate.