**SUPPLEMENTARY ONLINE MATERIALS**

Appendix S1 Testing measures for assessment of L1 achievement

Appendix S2 Testing measures for assessment of L2 aptitude and L2 achievement

Appendix S3 SPSS output including diagnostic tests for multiple regression assumptions

Table S1 Correlations among all study variables

**Appendix S1: Testing Measures for Assessment of L1 Achievement**

|  |  |
| --- | --- |
| **Test/Subtest** | **Description** |
| L1 Word Decoding |  |
| Woodcock Reading Mastery Test-Revised Basic Skills Cluster (WRMT-R)  | Comprised of two subtests, *Word Identification* measures ability to read and pronounce increasingly difficult (real) words correctly. *Word Attack* measures ability to read and pronounce increasingly difficult pseudo (nonsense) words correctly that conform to English spelling rules. Test reliability of .96 reported by test’s authors. |
| L1 Reading Comprehension |  |
| Woodcock Reading Mastery Test-Revised Reading Comprehension Cluster | Comprised of two subtests, *Word Comprehension* measures ability to read target words and respond verbally with antonym or synonym and to read and complete analogies. *Passage Comprehension* measures ability to read short passage and identify key word missing from passage (i.e., modified cloze procedure). Test reliability of .93 reported by test’s authors. |
| L1 Spelling |  |
| Test of Written Spelling-2 (TWS) | Ability to spell increasingly difficult words in dictated word format. Student writes words spoken by the examiner, responses marked correct or incorrect**.** Test reliability of .95 reported by test’s authors. |
| L1 Vocabulary |  |
| Peabody Picture Vocabulary Test-R/III (PPVT) | Test measures receptive vocabulary for standard American English. Student shown four pictures and identifies the picture for the word spoken aloud. Test reliability of .82 reported by test’s authors. |
| L1 Listening (Language) Comprehension |  |
| Woodcock Reading Mastery Test-Revised Passage Comprehension subtest (WRMT-R) | Cloze test, examiner reads a short passage (1-2 sentences) aloud and student identifies a key word missing from passage. Student is not permitted to read (see) passage, but passage can be repeated. An alternative procedure was recommended by Aaron (1989) as a diagnostic indicator for identifying problem readers. Test reliability of .93 reported by Aaron (1991). |
| **Phonemic Awareness** |  |
| Lindamood Auditory Conceptualization Test (LAC) | Ability to complete phonological processing tasks (rhyme, syllables, phonemes). Student shows number, sameness, or difference of sounds with colored blocks, changes in spoken patterns without associating the sounds with letters. |

**Appendix S2: Testing Measures for Assessment of L2 Aptitude and L2 Achievement**

|  |  |
| --- | --- |
| **Test/Subtest** | **Description** |
| L2 Aptitude |  |
| Modern Language Aptitude Test (MLAT) | *Number Learning*--student learns numbers of a made-up language and transcribes spoken number words into written digits on hearing them presented rapidly; *Phonetic Script*--student listens to sequence of syllables (many with no meaning in English) while looking at their graphemic transcriptions and quickly learn how the sounds (phonemes) correspond to the letters (graphemes); *Spelling Clues*--student reads English words presented as abbreviated spellings (e.g., luv) and chooses one word (out of five) that corresponds most nearly in meaning (e.g., carry, exist, affection, wash, spy); *Words in Sentences*--student reads key sentence with underlined word, reads another sentence with five words and phrases underlined as choices, and chooses word or phrase in second sentence with same grammatical function as marked word or phrase in key sentence; and *Paired Associates*--student studies list of nonsense words with assigned English meanings and chooses correct English word from multiple choice format to match nonsense word. A test-retest reliability of .90 (ninth grade males) to .91 (ninth grade females) was reported by the authors. |
| L2 Achievement |  |
| L2 Word Decoding | Ability to read real words and pseudowords in either Spanish, French, or German. Words measured a specific decoding task involving use of vowel sounds not consistent with vowel sounds in English. Vowel sounds in L2s used different letter combinations and contained multisyllabic words and words with diacritical markings. Student had to produce natural reading (pronunciation) of the words. For the Spanish words, the reliability coefficient for the word decoding list was .75, and for the pseudoword decoding list, .75. For the French words, it was .78, and .84, respectively. For the German words, it was .81, and .79, respectively. |
| L2 Spelling | Ability to spell words in either Spanish, French, or German. Words included vowel sounds not consistent with vowel sounds in English, used different letter combinations, and contained multisyllabic words and words with diacritical markings. Student wrote the words spoken by the examiner. For the Spanish words, the reliability coefficient was .78; for the French words, it was .81; and for the German words, .74. |
| L2 Reading Comprehension | Students read one-page letter written in the L2. The three foreign-language reading comprehension tests (French, Spanish, German) each used the same letter and comprehension questions. The only differences in the three letters were those specific to a particular foreign language. Students also read a passage from a popular publication, e.g., *Reader’s Digest,* in Spanish, French, or German and answered 10 multiple-choice questions in English about each passage. Questions were written in English to conform to ACTFL proficiency guidelines. Cronbach’s alpha for the L2 reading comprehension measure was .76. |
| L2 Writing | Students wrote response in L2 to letter from the reading comprehension task. Letter contained five questions to which students responded. Students given 15 minutes to write letter. Each student’s writing scored for five criteria--vocabulary, cultural appropriateness, structure, comprehensibility, spelling—according to ACTFL guidelines. Cronbach’s alpha for the L2 writing measure was .77. |
| L2 Oral Proficiency(Speaking and Listening Comprehension) | Students’ oral language production and oral language comprehension was assessed with 10–15-minute individual oral proficiency interview. Interviewers used randomly selected topics about which students conversed. Each interview taped for later scoring. Oral interview scored for five criteria-- pronunciation, vocabulary, grammar, comprehensibility, listening comprehension-- according to ACTFL guidelines. Cronbach’s alpha for the L2 listening/speaking measure was .93. |

|  |
| --- |
| Table S1*Correlations Among All Study Variables* |
|  | L1Decod | L1RComp | L1Vocab | L1Spell | L1PhonAw | L1LisCmp L2Read | L2Write | L2Oral | L2Oral |
| L1RComp | .919\*\* |  |  |  |  |  |  |  |  |
| L1Vocab | .574\*\* | .735\*\* |  |  |  |  |  |  |  |
| L1Spell | .938\*\* | .891\*\* | .589\*\* |  |  |  |  |  |  |
| L1PhonAw | .682\*\* | .653\*\* | .464\*\* | .675\*\* |  |  |  |  |  |
| L1LisCmp | .639\*\* | .770\*\* | .748\*\* | .605\*\* | .485\*\* |  |  |  |  |
| L2Read | .606\*\* | .545\*\* | .382\*\* | .624\*\* | .507\*\* | .426\*\* |  |  |  |
| L2Write | .565\*\* | .575\*\* | .473\*\* | .631\*\* | .591\*\* | .419\*\* | .699\*\* |  |  |
| L2Oral | .399\*\* | .470\*\* | .459\*\* | .447\*\* | .309\* | .398\*\* | .485\*\* | .604\*\* |  |
| MLAT | .738\*\* | .774\*\* | .675\*\* | .784\*\* | .661\*\* | .613\*\* | .683\*\* | .723\*\* | .541\*\* |
| \*\*. Correlation is significant at the 0.01 level (2-tailed). |
| \*. Correlation is significant at the 0.05 level (2-tailed).All *n* = 54. |

**Appendix S3: SPSS output including diagnostic tests for multiple regression assumptions**

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Tests of assumptions for regressions\* in Tables 4 and 5.\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*.\* compute L1 measures as mean of relevant tests across grades.compute L1Decod=Mean(Decode1a to Decode5).compute L1RComp=Mean(Rcomp1a to Rcomp5).compute L1Vocab=Mean(Vocab1a to Vocab5).compute L1Spell=Mean(Spelling1a to Spelling5).compute L1PhonAw=Mean(PhonAw1a to PhonAw3).compute L1LisCmp=Mean(LComp3, LComp5).\*compute standardized L2 measures.desc FLWordPseudoDecode (L2zdecod) FLReadComp (L2zRComp).

**Descriptives**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:01 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User defined missing values are treated as missing. |
| Cases Used | All non-missing data are used. |
| Syntax | desc FLWordPseudoDecode (L2zdecod) FLReadComp (L2zRComp). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.01 |
| Variables Created or Modified | L2zdecod | Zscore(FLWordPseudoDecode) |
| L2zRComp | Zscore(FLReadComp) |

[DataSet1]

|  |
| --- |
| **Descriptive Statistics** |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| FLWordPseudoDecode | 54 | 10 | 39 | 25.65 | 7.047 |
| FLReadComp | 54 | 4 | 16 | 10.20 | 2.987 |
| Valid N (listwise) | 54 |  |  |  |  |

compute L2Read = Mean(L2zdecod,L2zRComp).desc FLWrite (L2zWrite) FLSpell (L2zSpell).

**Descriptives**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:01 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User defined missing values are treated as missing. |
| Cases Used | All non-missing data are used. |
| Syntax | desc FLWrite (L2zWrite) FLSpell (L2zSpell). |
| Resources | Processor Time | 00:00:00.02 |
| Elapsed Time | 00:00:00.01 |
| Variables Created or Modified | L2zWrite | Zscore(FLWrite) |
| L2zSpell | Zscore(FLSpell) |

|  |
| --- |
| **Descriptive Statistics** |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| FLWrite | 54 | 0 | 24 | 8.00 | 6.425 |
| FLSpell | 54 | 2 | 18 | 8.83 | 3.565 |
| Valid N (listwise) | 54 |  |  |  |  |

compute L2Write = Mean(L2zWrite,L2zSpell).desc FLListenSpeak (L2zOral).

**Descriptives**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:01 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User defined missing values are treated as missing. |
| Cases Used | All non-missing data are used. |
| Syntax | desc FLListenSpeak (L2zOral). |
| Resources | Processor Time | 00:00:00.00 |
| Elapsed Time | 00:00:00.01 |
| Variables Created or Modified | L2zOral | Zscore(FLListenSpeak) |

|  |
| --- |
| **Descriptive Statistics** |
|  | N | Minimum | Maximum | Mean | Std. Deviation |
| FLListenSpeak | 54 | 0 | 21 | 6.96 | 4.903 |
| Valid N (listwise) | 54 |  |  |  |  |

compute L2Oral=L2zOral.compute MLATh=MLAT.\* regressions to estimate effect of MLAT after L1 measures, for Table 5\* includes assessment of assumptions\* final regression in this section is for Table 4.REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT L2Read /METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp /Method=enter MLATh /SCATTERPLOT=(\*ZRESID ,\*ZPRED) /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID) /CASEWISE PLOT(ZRESID) OUTLIERS(3).

**Regression**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:01 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on cases with no missing values for any variable used. |
| Syntax | REGRESSION/MISSING LISTWISE/STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL/CRITERIA=PIN(.05) POUT(.10)/NOORIGIN/DEPENDENT L2Read/METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp/Method=enter MLATh/SCATTERPLOT=(\*ZRESID ,\*ZPRED)/RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)/CASEWISE PLOT(ZRESID) OUTLIERS(3). |
| Resources | Processor Time | 00:00:04.11 |
| Elapsed Time | 00:00:01.44 |
| Memory Required | 9024 bytes |
| Additional Memory Required for Residual Plots | 800 bytes |

|  |
| --- |
| **Variables Entered/Removed**a |
| Model | Variables Entered | Variables Removed | Method |
| 1 | L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decodb | . | Enter |
| 2 | MLAThb | . | Enter |
| a. Dependent Variable: L2Read |
| b. All requested variables entered. |

|  |
| --- |
| **Model Summary**c |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |
| R Square Change | F Change | df1 |
| 1 | .649a | .421 | .347 | .72815 | .421 | 5.693 | 6 |
| 2 | .726b | .528 | .456 | .66471 | .107 | 10.398 | 1 |

|  |
| --- |
| **Model Summary**c |
| Model | Change Statistics | Durbin-Watson |
| df2 | Sig. F Change |
| 1 | 47 | <.001 |  |
| 2 | 46 | .002 | 2.452 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod, MLATh |
| c. Dependent Variable: L2Read |

|  |
| --- |
| **ANOVA**a |
| Model | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 18.111 | 6 | 3.019 | 5.693 | <.001b |
| Residual | 24.919 | 47 | .530 |  |  |
| Total | 43.030 | 53 |  |  |  |
| 2 | Regression | 22.706 | 7 | 3.244 | 7.341 | <.001c |
| Residual | 20.325 | 46 | .442 |  |  |
| Total | 43.030 | 53 |  |  |  |
| a. Dependent Variable: L2Read |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| c. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod, MLATh |

|  |
| --- |
| **Coefficients**a |
| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Collinearity Statistics |
| B | Std. Error | Beta | Tolerance |
| 1 | (Constant) | -4.453 | 1.406 |  | -3.168 | .003 |  |
| L1Decod | .023 | .029 | .315 | .779 | .440 | .075 |
| L1RComp | -.034 | .031 | -.434 | -1.086 | .283 | .077 |
| L1Vocab | .004 | .015 | .046 | .243 | .809 | .337 |
| L1Spell | .039 | .026 | .498 | 1.485 | .144 | .110 |
| L1PhonAw | .161 | .173 | .144 | .934 | .355 | .519 |
| L1LisCmp | .013 | .017 | .153 | .779 | .440 | .320 |
| 2 | (Constant) | -4.486 | 1.283 |  | -3.495 | .001 |  |
| L1Decod | .031 | .027 | .432 | 1.166 | .249 | .075 |
| L1RComp | -.039 | .028 | -.495 | -1.356 | .182 | .077 |
| L1Vocab | -.010 | .015 | -.118 | -.651 | .519 | .310 |
| L1Spell | .012 | .025 | .156 | .480 | .633 | .098 |
| L1PhonAw | .015 | .164 | .013 | .089 | .929 | .479 |
| L1LisCmp | .013 | .016 | .147 | .819 | .417 | .320 |
| MLATh | .036 | .011 | .606 | 3.225 | .002 | .290 |

|  |
| --- |
| **Coefficients**a |
| Model | Collinearity Statistics |
| VIF |
| 1 | (Constant) |  |
| L1Decod | 13.257 |
| L1RComp | 12.938 |
| L1Vocab | 2.969 |
| L1Spell | 9.128 |
| L1PhonAw | 1.926 |
| L1LisCmp | 3.122 |
| 2 | (Constant) |  |
| L1Decod | 13.386 |
| L1RComp | 12.973 |
| L1Vocab | 3.224 |
| L1Spell | 10.226 |
| L1PhonAw | 2.086 |
| L1LisCmp | 3.123 |
| MLATh | 3.445 |
|  |  |  |  |  |  |  |  |

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| --- |
| a. Dependent Variable: L2Read |

|  |
| --- |
| **Excluded Variables**a |
| Model | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics |
| Tolerance | VIF |
| 1 | MLATh | .606b | 3.225 | .002 | .429 | .290 | 3.445 |

|  |
| --- |
| **Excluded Variables**a |
| Model | Collinearity Statistics |
| Minimum Tolerance |
| 1 | MLATh | .075 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Read |
| b. Predictors in the Model: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions |
| (Constant) | L1Decod | L1RComp | L1Vocab |
| 1 | 1 | 5.997 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.465 | .00 | .00 | .00 | .00 |
| 3 | .007 | 28.380 | .02 | .04 | .00 | .14 |
| 4 | .005 | 36.127 | .83 | .00 | .02 | .08 |
| 5 | .003 | 48.223 | .00 | .00 | .00 | .57 |
| 6 | .001 | 77.227 | .08 | .11 | .32 | .00 |
| 7 | .001 | 97.726 | .06 | .85 | .66 | .21 |
| 2 | 1 | 6.991 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.662 | .00 | .00 | .00 | .00 |
| 3 | .007 | 30.585 | .04 | .03 | .00 | .12 |
| 4 | .006 | 32.895 | .11 | .01 | .00 | .02 |
| 5 | .004 | 39.874 | .71 | .00 | .03 | .05 |
| 6 | .002 | 54.407 | .00 | .00 | .00 | .63 |
| 7 | .001 | 85.468 | .09 | .07 | .35 | .03 |
| 8 | .001 | 106.276 | .06 | .88 | .62 | .15 |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Variance Proportions |
| L1Spell | L1PhonAw | L1LisCmp | MLATh |
| 1 | 1 | .00 | .00 | .00 |  |
| 2 | .00 | .52 | .00 |  |
| 3 | .05 | .15 | .07 |  |
| 4 | .00 | .32 | .03 |  |
| 5 | .02 | .00 | .66 |  |
| 6 | .78 | .01 | .21 |  |
| 7 | .15 | .01 | .03 |  |
| 2 | 1 | .00 | .00 | .00 | .00 |
| 2 | .00 | .48 | .00 | .00 |
| 3 | .04 | .19 | .08 | .02 |
| 4 | .00 | .15 | .01 | .68 |
| 5 | .00 | .17 | .07 | .10 |
| 6 | .01 | .01 | .62 | .13 |
| 7 | .75 | .00 | .19 | .06 |
| 8 | .19 | .01 | .02 | .02 |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Read |

|  |
| --- |
| **Residuals Statistics**a |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | -1.3568 | 1.4888 | .0000 | .65453 | 54 |
| Residual | -1.52589 | 1.55672 | .00000 | .61926 | 54 |
| Std. Predicted Value | -2.073 | 2.275 | .000 | 1.000 | 54 |
| Std. Residual | -2.296 | 2.342 | .000 | .932 | 54 |
| a. Dependent Variable: L2Read |

**Charts**







REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOLL ZPP /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT L2Write /METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp /Method=enter MLATh /SCATTERPLOT=(\*ZRESID ,\*ZPRED) /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID) /CASEWISE PLOT(ZRESID) OUTLIERS(3).

**Regression**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:03 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on cases with no missing values for any variable used. |
| Syntax | REGRESSION/MISSING LISTWISE/STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOLL ZPP/CRITERIA=PIN(.05) POUT(.10)/NOORIGIN/DEPENDENT L2Write/METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp/Method=enter MLATh/SCATTERPLOT=(\*ZRESID ,\*ZPRED)/RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)/CASEWISE PLOT(ZRESID) OUTLIERS(3). |
| Resources | Processor Time | 00:00:00.44 |
| Elapsed Time | 00:00:00.32 |
| Memory Required | 9024 bytes |
| Additional Memory Required for Residual Plots | 800 bytes |

|  |
| --- |
| **Variables Entered/Removed**a |
| Model | Variables Entered | Variables Removed | Method |
| 1 | L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decodb | . | Enter |
| 2 | MLAThb | . | Enter |
| a. Dependent Variable: L2Write |
| b. All requested variables entered. |

|  |
| --- |
| **Model Summary**c |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |
| R Square Change | F Change | df1 |
| 1 | .690a | .476 | .409 | .69264 | .476 | 7.106 | 6 |
| 2 | .749b | .561 | .495 | .64040 | .086 | 8.980 | 1 |

|  |
| --- |
| **Model Summary**c |
| Model | Change Statistics | Durbin-Watson |
| df2 | Sig. F Change |
| 1 | 47 | <.001 |  |
| 2 | 46 | .004 | 2.234 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod, MLATh |
| c. Dependent Variable: L2Write |

|  |
| --- |
| **ANOVA**a |
| Model | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 20.455 | 6 | 3.409 | 7.106 | <.001b |
| Residual | 22.548 | 47 | .480 |  |  |
| Total | 43.003 | 53 |  |  |  |
| 2 | Regression | 24.138 | 7 | 3.448 | 8.408 | <.001c |
| Residual | 18.865 | 46 | .410 |  |  |
| Total | 43.003 | 53 |  |  |  |
| a. Dependent Variable: L2Write |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| c. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod, MLATh |

|  |
| --- |
| **Coefficients**a |
| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Correlations |
| B | Std. Error | Beta | Zero-order |
| 1 | (Constant) | -3.420 | 1.337 |  | -2.557 | .014 |  |
| L1Decod | -.027 | .028 | -.377 | -.979 | .332 | .565 |
| L1RComp | .002 | .030 | .028 | .075 | .941 | .575 |
| L1Vocab | .012 | .015 | .151 | .829 | .411 | .473 |
| L1Spell | .052 | .025 | .677 | 2.122 | .039 | .631 |
| L1PhonAw | .362 | .164 | .323 | 2.203 | .033 | .591 |
| L1LisCmp | -.004 | .016 | -.042 | -.223 | .825 | .419 |
| 2 | (Constant) | -3.449 | 1.236 |  | -2.790 | .008 |  |
| L1Decod | -.020 | .026 | -.271 | -.760 | .451 | .565 |
| L1RComp | -.002 | .027 | -.026 | -.075 | .941 | .575 |
| L1Vocab | .000 | .014 | .003 | .019 | .985 | .473 |
| L1Spell | .029 | .024 | .371 | 1.187 | .241 | .631 |
| L1PhonAw | .230 | .158 | .206 | 1.458 | .151 | .591 |
| L1LisCmp | -.004 | .015 | -.047 | -.273 | .786 | .419 |
| MLATh | .032 | .011 | .543 | 2.997 | .004 | .723 |

|  |
| --- |
| **Coefficients**a |
| Model | Correlations | Collinearity Statistics |
| Partial | Part | Tolerance | VIF |
| 1 | (Constant) |  |  |  |  |
| L1Decod | -.141 | -.103 | .075 | 13.257 |
| L1RComp | .011 | .008 | .077 | 12.938 |
| L1Vocab | .120 | .088 | .337 | 2.969 |
| L1Spell | .296 | .224 | .110 | 9.128 |
| L1PhonAw | .306 | .233 | .519 | 1.926 |
| L1LisCmp | -.032 | -.024 | .320 | 3.122 |
| 2 | (Constant) |  |  |  |  |
| L1Decod | -.111 | -.074 | .075 | 13.386 |
| L1RComp | -.011 | -.007 | .077 | 12.973 |
| L1Vocab | .003 | .002 | .310 | 3.224 |
| L1Spell | .172 | .116 | .098 | 10.226 |
| L1PhonAw | .210 | .142 | .479 | 2.086 |
| L1LisCmp | -.040 | -.027 | .320 | 3.123 |
| MLATh | .404 | .293 | .290 | 3.445 |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Write |

|  |
| --- |
| **Excluded Variables**a |
| Model | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics |
| Tolerance | VIF |
| 1 | MLATh | .543b | 2.997 | .004 | .404 | .290 | 3.445 |

|  |
| --- |
| **Excluded Variables**a |
| Model | Collinearity Statistics |
| Minimum Tolerance |
| 1 | MLATh | .075 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Write |
| b. Predictors in the Model: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions |
| (Constant) | L1Decod | L1RComp | L1Vocab |
| 1 | 1 | 5.997 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.465 | .00 | .00 | .00 | .00 |
| 3 | .007 | 28.380 | .02 | .04 | .00 | .14 |
| 4 | .005 | 36.127 | .83 | .00 | .02 | .08 |
| 5 | .003 | 48.223 | .00 | .00 | .00 | .57 |
| 6 | .001 | 77.227 | .08 | .11 | .32 | .00 |
| 7 | .001 | 97.726 | .06 | .85 | .66 | .21 |
| 2 | 1 | 6.991 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.662 | .00 | .00 | .00 | .00 |
| 3 | .007 | 30.585 | .04 | .03 | .00 | .12 |
| 4 | .006 | 32.895 | .11 | .01 | .00 | .02 |
| 5 | .004 | 39.874 | .71 | .00 | .03 | .05 |
| 6 | .002 | 54.407 | .00 | .00 | .00 | .63 |
| 7 | .001 | 85.468 | .09 | .07 | .35 | .03 |
| 8 | .001 | 106.276 | .06 | .88 | .62 | .15 |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Variance Proportions |
| L1Spell | L1PhonAw | L1LisCmp | MLATh |
| 1 | 1 | .00 | .00 | .00 |  |
| 2 | .00 | .52 | .00 |  |
| 3 | .05 | .15 | .07 |  |
| 4 | .00 | .32 | .03 |  |
| 5 | .02 | .00 | .66 |  |
| 6 | .78 | .01 | .21 |  |
| 7 | .15 | .01 | .03 |  |
| 2 | 1 | .00 | .00 | .00 | .00 |
| 2 | .00 | .48 | .00 | .00 |
| 3 | .04 | .19 | .08 | .02 |
| 4 | .00 | .15 | .01 | .68 |
| 5 | .00 | .17 | .07 | .10 |
| 6 | .01 | .01 | .62 | .13 |
| 7 | .75 | .00 | .19 | .06 |
| 8 | .19 | .01 | .02 | .02 |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Write |

|  |
| --- |
| **Residuals Statistics**a |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | -1.5058 | 1.2586 | .0000 | .67486 | 54 |
| Residual | -.89883 | 1.25478 | .00000 | .59662 | 54 |
| Std. Predicted Value | -2.231 | 1.865 | .000 | 1.000 | 54 |
| Std. Residual | -1.404 | 1.959 | .000 | .932 | 54 |
| a. Dependent Variable: L2Write |

**Charts**







REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL ZPP /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT L2Oral /METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp /Method=enter MLATh /SCATTERPLOT=(\*ZRESID ,\*ZPRED) /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID) /CASEWISE PLOT(ZRESID) OUTLIERS(3).

**Regression**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:03 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on cases with no missing values for any variable used. |
| Syntax | REGRESSION/MISSING LISTWISE/STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL ZPP/CRITERIA=PIN(.05) POUT(.10)/NOORIGIN/DEPENDENT L2Oral/METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp/Method=enter MLATh/SCATTERPLOT=(\*ZRESID ,\*ZPRED)/RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)/CASEWISE PLOT(ZRESID) OUTLIERS(3). |
| Resources | Processor Time | 00:00:00.36 |
| Elapsed Time | 00:00:00.30 |
| Memory Required | 9024 bytes |
| Additional Memory Required for Residual Plots | 800 bytes |

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| --- |
| **Variables Entered/Removed**a |
| Model | Variables Entered | Variables Removed | Method |
| 1 | L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decodb | . | Enter |
| 2 | MLAThb | . | Enter |
| a. Dependent Variable: L2Oral |
| b. All requested variables entered. |

|  |
| --- |
| **Model Summary**c |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |
| R Square Change | F Change | df1 |
| 1 | .521a | .272 | .179 | .90629 | .272 | 2.921 | 6 |
| 2 | .569b | .324 | .221 | .88245 | .052 | 3.573 | 1 |

|  |
| --- |
| **Model Summary**c |
| Model | Change Statistics | Durbin-Watson |
| df2 | Sig. F Change |
| 1 | 47 | .017 |  |
| 2 | 46 | .065 | 1.657 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

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| --- |
| a. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod, MLATh |
| c. Dependent Variable: L2Oral |

|  |
| --- |
| **ANOVA**a |
| Model | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 14.396 | 6 | 2.399 | 2.921 | .017b |
| Residual | 38.604 | 47 | .821 |  |  |
| Total | 53.000 | 53 |  |  |  |
| 2 | Regression | 17.179 | 7 | 2.454 | 3.151 | .008c |
| Residual | 35.821 | 46 | .779 |  |  |
| Total | 53.000 | 53 |  |  |  |
| a. Dependent Variable: L2Oral |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| c. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod, MLATh |

|  |
| --- |
| **Coefficients**a |
| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Correlations |
| B | Std. Error | Beta | Zero-order |
| 1 | (Constant) | -4.945 | 1.750 |  | -2.826 | .007 |  |
| L1Decod | -.032 | .036 | -.402 | -.888 | .379 | .399 |
| L1RComp | .024 | .039 | .278 | .621 | .538 | .470 |
| L1Vocab | .019 | .019 | .217 | 1.014 | .316 | .459 |
| L1Spell | .038 | .032 | .444 | 1.181 | .243 | .447 |
| L1PhonAw | -.005 | .215 | -.004 | -.023 | .982 | .309 |
| L1LisCmp | .001 | .021 | .011 | .052 | .959 | .398 |
| 2 | (Constant) | -4.970 | 1.704 |  | -2.917 | .005 |  |
| L1Decod | -.026 | .035 | -.320 | -.721 | .474 | .399 |
| L1RComp | .020 | .038 | .235 | .539 | .593 | .470 |
| L1Vocab | .009 | .019 | .102 | .468 | .642 | .459 |
| L1Spell | .018 | .033 | .204 | .527 | .601 | .447 |
| L1PhonAw | -.119 | .218 | -.096 | -.546 | .588 | .309 |
| L1LisCmp | .001 | .021 | .007 | .033 | .974 | .398 |
| MLATh | .028 | .015 | .425 | 1.890 | .065 | .541 |

|  |
| --- |
| **Coefficients**a |
| Model | Correlations | Collinearity Statistics |
| Partial | Part | Tolerance | VIF |
| 1 | (Constant) |  |  |  |  |
| L1Decod | -.128 | -.111 | .075 | 13.257 |
| L1RComp | .090 | .077 | .077 | 12.938 |
| L1Vocab | .146 | .126 | .337 | 2.969 |
| L1Spell | .170 | .147 | .110 | 9.128 |
| L1PhonAw | -.003 | -.003 | .519 | 1.926 |
| L1LisCmp | .008 | .006 | .320 | 3.122 |
| 2 | (Constant) |  |  |  |  |
| L1Decod | -.106 | -.087 | .075 | 13.386 |
| L1RComp | .079 | .065 | .077 | 12.973 |
| L1Vocab | .069 | .057 | .310 | 3.224 |
| L1Spell | .077 | .064 | .098 | 10.226 |
| L1PhonAw | -.080 | -.066 | .479 | 2.086 |
| L1LisCmp | .005 | .004 | .320 | 3.123 |
| MLATh | .268 | .229 | .290 | 3.445 |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Oral |

|  |
| --- |
| **Excluded Variables**a |
| Model | Beta In | t | Sig. | Partial Correlation | Collinearity Statistics |
| Tolerance | VIF |
| 1 | MLATh | .425b | 1.890 | .065 | .268 | .290 | 3.445 |

|  |
| --- |
| **Excluded Variables**a |
| Model | Collinearity Statistics |
| Minimum Tolerance |
| 1 | MLATh | .075 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

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| --- |
| a. Dependent Variable: L2Oral |
| b. Predictors in the Model: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions |
| (Constant) | L1Decod | L1RComp | L1Vocab |
| 1 | 1 | 5.997 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.465 | .00 | .00 | .00 | .00 |
| 3 | .007 | 28.380 | .02 | .04 | .00 | .14 |
| 4 | .005 | 36.127 | .83 | .00 | .02 | .08 |
| 5 | .003 | 48.223 | .00 | .00 | .00 | .57 |
| 6 | .001 | 77.227 | .08 | .11 | .32 | .00 |
| 7 | .001 | 97.726 | .06 | .85 | .66 | .21 |
| 2 | 1 | 6.991 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.662 | .00 | .00 | .00 | .00 |
| 3 | .007 | 30.585 | .04 | .03 | .00 | .12 |
| 4 | .006 | 32.895 | .11 | .01 | .00 | .02 |
| 5 | .004 | 39.874 | .71 | .00 | .03 | .05 |
| 6 | .002 | 54.407 | .00 | .00 | .00 | .63 |
| 7 | .001 | 85.468 | .09 | .07 | .35 | .03 |
| 8 | .001 | 106.276 | .06 | .88 | .62 | .15 |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Variance Proportions |
| L1Spell | L1PhonAw | L1LisCmp | MLATh |
| 1 | 1 | .00 | .00 | .00 |  |
| 2 | .00 | .52 | .00 |  |
| 3 | .05 | .15 | .07 |  |
| 4 | .00 | .32 | .03 |  |
| 5 | .02 | .00 | .66 |  |
| 6 | .78 | .01 | .21 |  |
| 7 | .15 | .01 | .03 |  |
| 2 | 1 | .00 | .00 | .00 | .00 |
| 2 | .00 | .48 | .00 | .00 |
| 3 | .04 | .19 | .08 | .02 |
| 4 | .00 | .15 | .01 | .68 |
| 5 | .00 | .17 | .07 | .10 |
| 6 | .01 | .01 | .62 | .13 |
| 7 | .75 | .00 | .19 | .06 |
| 8 | .19 | .01 | .02 | .02 |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: L2Oral |

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| --- |
| **Residuals Statistics**a |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | -1.2028 | 1.1746 | .0000 | .56932 | 54 |
| Residual | -1.66166 | 2.08972 | .00000 | .82212 | 54 |
| Std. Predicted Value | -2.113 | 2.063 | .000 | 1.000 | 54 |
| Std. Residual | -1.883 | 2.368 | .000 | .932 | 54 |
| a. Dependent Variable: L2Oral |

**Charts**







REGRESSION /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL ZPP /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT MLATh /METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp /SCATTERPLOT=(\*ZRESID ,\*ZPRED) /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID) /CASEWISE PLOT(ZRESID) OUTLIERS(3).

**Regression**

|  |
| --- |
| **Notes** |
| Output Created | 21-SEP-2023 14:16:03 |
| Comments |  |
| Input | Data | C:\Users\Philip\Documents\Sparks Projects\Indiana MLAT replication - AP\uniqueness\_efficiency\_01192023.csv |
| Active Dataset | DataSet1 |
| Filter | <none> |
| Weight | <none> |
| Split File | <none> |
| N of Rows in Working Data File | 54 |
| Missing Value Handling | Definition of Missing | User-defined missing values are treated as missing. |
| Cases Used | Statistics are based on cases with no missing values for any variable used. |
| Syntax | REGRESSION/MISSING LISTWISE/STATISTICS COEFF OUTS R ANOVA CHANGE COLLIN TOL ZPP/CRITERIA=PIN(.05) POUT(.10)/NOORIGIN/DEPENDENT MLATh/METHOD=enter L1Decod L1RComp L1Vocab L1Spell L1PhonAw L1LisCmp/SCATTERPLOT=(\*ZRESID ,\*ZPRED)/RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)/CASEWISE PLOT(ZRESID) OUTLIERS(3). |
| Resources | Processor Time | 00:00:00.47 |
| Elapsed Time | 00:00:00.31 |
| Memory Required | 8128 bytes |
| Additional Memory Required for Residual Plots | 816 bytes |

|  |
| --- |
| **Variables Entered/Removed**a |
| Model | Variables Entered | Variables Removed | Method |
| 1 | L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decodb | . | Enter |
| a. Dependent Variable: MLATh |
| b. All requested variables entered. |

|  |
| --- |
| **Model Summary**b |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |
| R Square Change | F Change | df1 |
| 1 | .842a | .710 | .673 | 8.62169 | .710 | 19.152 | 6 |

|  |
| --- |
| **Model Summary**b |
| Model | Change Statistics | Durbin-Watson |
| df2 | Sig. F Change |
| 1 | 47 | <.001 | 1.889 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |
| b. Dependent Variable: MLATh |

|  |
| --- |
| **ANOVA**a |
| Model | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 8542.025 | 6 | 1423.671 | 19.152 | <.001b |
| Residual | 3493.678 | 47 | 74.334 |  |  |
| Total | 12035.704 | 53 |  |  |  |
| a. Dependent Variable: MLATh |
| b. Predictors: (Constant), L1LisCmp, L1PhonAw, L1Spell, L1Vocab, L1RComp, L1Decod |

|  |
| --- |
| **Coefficients**a |
| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Correlations |
| B | Std. Error | Beta | Zero-order |
| 1 | (Constant) | .906 | 16.644 |  | .054 | .957 |  |
| L1Decod | -.233 | .344 | -.194 | -.677 | .502 | .738 |
| L1RComp | .131 | .369 | .101 | .356 | .723 | .774 |
| L1Vocab | .366 | .182 | .272 | 2.007 | .050 | .675 |
| L1Spell | .731 | .307 | .564 | 2.377 | .022 | .784 |
| L1PhonAw | 4.042 | 2.044 | .216 | 1.978 | .054 | .661 |
| L1LisCmp | .015 | .202 | .010 | .073 | .942 | .613 |

|  |
| --- |
| **Coefficients**a |
| Model | Correlations | Collinearity Statistics |
| Partial | Part | Tolerance | VIF |
| 1 | (Constant) |  |  |  |  |
| L1Decod | -.098 | -.053 | .075 | 13.257 |
| L1RComp | .052 | .028 | .077 | 12.938 |
| L1Vocab | .281 | .158 | .337 | 2.969 |
| L1Spell | .328 | .187 | .110 | 9.128 |
| L1PhonAw | .277 | .155 | .519 | 1.926 |
| L1LisCmp | .011 | .006 | .320 | 3.122 |
|  |  |  |  |  |  |  |  |

|  |
| --- |
| a. Dependent Variable: MLATh |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Eigenvalue | Condition Index | Variance Proportions |
| (Constant) | L1Decod | L1RComp | L1Vocab |
| 1 | 1 | 5.997 | 1.000 | .00 | .00 | .00 | .00 |
| 2 | .987 | 2.465 | .00 | .00 | .00 | .00 |
| 3 | .007 | 28.380 | .02 | .04 | .00 | .14 |
| 4 | .005 | 36.127 | .83 | .00 | .02 | .08 |
| 5 | .003 | 48.223 | .00 | .00 | .00 | .57 |
| 6 | .001 | 77.227 | .08 | .11 | .32 | .00 |
| 7 | .001 | 97.726 | .06 | .85 | .66 | .21 |

|  |
| --- |
| **Collinearity Diagnostics**a |
| Model | Dimension | Variance Proportions |
| L1Spell | L1PhonAw | L1LisCmp |
| 1 | 1 | .00 | .00 | .00 |
| 2 | .00 | .52 | .00 |
| 3 | .05 | .15 | .07 |
| 4 | .00 | .32 | .03 |
| 5 | .02 | .00 | .66 |
| 6 | .78 | .01 | .21 |
| 7 | .15 | .01 | .03 |
|  |  |  |  |  |  |  |  |

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| --- |
| a. Dependent Variable: MLATh |

|  |
| --- |
| **Residuals Statistics**a |
|  | Minimum | Maximum | Mean | Std. Deviation | N |
| Predicted Value | 78.3208 | 129.9805 | 100.9259 | 12.69529 | 54 |
| Residual | -16.38441 | 24.16625 | .00000 | 8.11902 | 54 |
| Std. Predicted Value | -1.781 | 2.289 | .000 | 1.000 | 54 |
| Std. Residual | -1.900 | 2.803 | .000 | .942 | 54 |
| a. Dependent Variable: MLATh |

**Charts**







