Cognitive and non-cognitive predictors of Spanish foreign language proficiency

Anita R. Bowles, Joel T. Koeth, Jared A. Linck, Michael F. Bunting

Abstract

Adults studying foreign language (FL) in a classroom setting vary widely in their attained levels of proficiency. FL aptitude tests aim to predict these differences in outcome primarily through measures of cognitive ability (e.g., fluid intelligence, long-term memory, and auditory processing). However, considerable variance in readiness for FL learning remains to be explained, perhaps by non-cognitive measures of individual differences. In a single-semester longitudinal study of low and intermediate college-level Spanish students (N = 102), we measured general fluid intelligence, FL classroom exposure, a set of non-cognitive measures, FL reading and listening proficiency, and achievement goals. Results suggest that measures of motivation, self-efficacy, personality, and attitudes toward learning predict attained Spanish proficiency over and above general fluid intelligence and classroom exposure to the language. Further, certain non-cognitive factors were differentially related to FL reading and listening proficiencies. These results implicate both cognitive and non-cognitive components to FL aptitude.

Introduction

The measurement of foreign language aptitude can provide students, instructors, and policymakers with important information on students’ strengths and weaknesses. Existing aptitude tests are used in a variety of settings for several specific purposes. For example, the Defense Language Aptitude Battery (DLAB) is used by the U.S. military to identify those personnel most likely to succeed in intensive language study, and the Modern Language Aptitude Test may be used, along with other factors, to determine whether university students have a foreign language “disability.”

Traditionally, foreign language aptitude tests have focused on a small set of cognitive and perceptual abilities which correlate with general intelligence. However, research in second language acquisition suggests that non-cognitive measures, such as motivation, personality characteristics, affect, and learning styles may help to explain individual differences in language learning.

The purpose of this study was to investigate whether a set of non-cognitive traits and beliefs add to the prediction of foreign language learning over and above general intelligence and classroom exposure to the target language. The work reported here is a preliminary study in a larger research program designed to develop and test a more comprehensive theoretical model of L2 learning.

Method

Participants

102 University of Maryland students
70 female; Mean age = 21; Less than two years of university-level Spanish

Design

Participants completed two or three testing sessions for pay. Each session lasted 2-3 hours. Participants who tested for three sessions also piloted a series of cognitive tasks hypothesized to reflect language aptitude (not reported here).

Dependent Measures

• Two computer-delivered Spanish tests at the low-intermediate level
  • Minnesota Contextualized Reading Assessment (CoRA)
  • Minnesota Contextualized Listening Assessment (CoLA)

Data were analyzed by a series of combined stepwise-hierarchical regression analyses. GF was entered at Step 1 in each analysis and allowed to account for as much variance in the DVs as possible. Measures of personality, learning orientation, and motivation & self-efficacy were added at Step 2 with stepwise entry.

Results

<table>
<thead>
<tr>
<th>Construct &amp; Measures</th>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Fluid Intelligence</td>
<td>Raven’s Standard Progressive Matrices</td>
<td>Measures non-linguistic reasoning ability.</td>
</tr>
<tr>
<td>Personality</td>
<td>NEO Personality Inventory-Revised</td>
<td>Assesses the “Big 5” personality traits.</td>
</tr>
<tr>
<td></td>
<td>Measure of Ambiguity Tolerance</td>
<td>Measures the ability to accept ambiguous information or behavior in an open and neutral manner.</td>
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<tr>
<td>Need for Closure Scale</td>
<td></td>
<td>Measures preference for definitive answers and tolerance for open-endness.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Achievement Goal Inventory</td>
<td>Measures achievement motivation.</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>General Perceived Self-Efficacy Scale</td>
<td>Measures beliefs about one’s abilities and confidence in them.</td>
</tr>
<tr>
<td>Stress and Coping Scale</td>
<td></td>
<td>Assesses thoughts, actions, and strategies used to cope following academic setbacks or poor performance.</td>
</tr>
<tr>
<td>Learning Orientation</td>
<td>Inventory of Learning Styles</td>
<td>Assesses learning strategies and perceptions of learning.</td>
</tr>
<tr>
<td></td>
<td>Patterns of Adaptive Learning Scales</td>
<td>Measures achievement-related beliefs, attitudes, and strategies.</td>
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</tbody>
</table>

Data for analysis 

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Reading Comprehension</th>
<th>Listening Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>GF</td>
<td>.13 13.64* .36 3.69*</td>
<td>.13 13.80* .35 4.71*</td>
</tr>
<tr>
<td>Step 1: Openness to experience</td>
<td>.14 9.05* .30 3.09*</td>
<td>.05 5.77* .23 2.40*</td>
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</tbody>
</table>

Motivation & Self-Efficacy

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<thead>
<tr>
<th>Predictor</th>
<th>Reading Comprehension</th>
<th>Listening Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>GF</td>
<td>.13 13.64* .36 3.69*</td>
<td>.12 13.17* .34 3.62*</td>
</tr>
<tr>
<td>Step 2: Challenge mastery</td>
<td>.07 8.10* .27 2.85*</td>
<td>-- -- -- --</td>
</tr>
<tr>
<td>Learning goals</td>
<td>.04 4.11* .26 2.10*</td>
<td>-- -- -- --</td>
</tr>
<tr>
<td>Denial</td>
<td>-- -- -- --</td>
<td>.08 10.09* .29 3.18*</td>
</tr>
</tbody>
</table>

Learning Orientation

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Reading Comprehension</th>
<th>Listening Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td>GF</td>
<td>.13 13.64* .36 3.69*</td>
<td>.12 13.17* .34 3.62*</td>
</tr>
<tr>
<td>Step 2: Academic self-handicapping</td>
<td>-- -- -- --</td>
<td>.12 13.72* .26 2.88*</td>
</tr>
<tr>
<td>Classroom mastery</td>
<td>.11 12.88* .33 3.59*</td>
<td>.03 4.25* .19 2.06*</td>
</tr>
<tr>
<td>Deep processing strategies</td>
<td>.05 5.62* .22 2.37*</td>
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Discussion

Conclusions

• Foreign language reading and listening scores were predicted by measures of personality, motivation, self-efficacy, and learning orientation.

• These non-cognitive traits accounted for significant variance even after controlling for differences in general intelligence and amount of foreign language classroom exposure.

• Both reading and listening scores were predicted by the openness to experience personality trait and by general intelligence.

• Reading and listening scores showed different patterns of results for motivation, self-efficacy, and learning orientation variables.

Implications

• Including non-cognitive traits and beliefs within or alongside measures of foreign language aptitude should improve the predictive power of such measures.

• Openness to experience may be particularly important for adults learning a foreign language.

• Individual differences in non-cognitive traits and beliefs may differentially affect students’ achieved proficiency in foreign language reading and listening.

Future Work

• Further research is needed to develop a comprehensive theory of foreign language aptitude and learning processes. Such a theory should specify the relationships among general intelligence, specific cognitive and perceptual abilities (e.g., working memory, inhibitory control) and non-cognitive traits and beliefs.

• We are in the process of testing these variables with a large sample of adults learning a variety of foreign languages in an intensive setting.

References

See reference list on reverse side of handout.

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*p < .05
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