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Late Second Language Learners: What Predicts Good Outcomes?

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1. Introduction

Childhood language experience seems to have a special status in language acquisition. If deprived of early linguistic input—be it due to severe hearing impairments or childhood abuse and neglect—children generally do not fully acquire a language even when input is available later (e.g., Curtiss, 1977, 1989; Fromkin, Krashen, Curtiss, Rigler, & Rigler, 1974; Mayberry, 1993; Newport, 1990, 1991; Skuse, 1984a,b). These late learners can still master the more “robust” or “resilient” aspects of language, such as vocabulary and basic word order. However, the later they begin to receive linguistic input, the less native-like their ultimate linguistic competence will be, especially in the more “fragile” aspects of language, such as phonology and morphosyntax (see Goldin-Meadow & Mylander, 1990).

Research on onset of linguistic input suggests that late learners of a second language (L2) likewise typically do not fully master its phonology (e.g., Bialystok & Hakuta, 1994; Flege, 1987, 1991; Oyama, 1976; Williams, 1980) and morphosyntax (e.g., Johnson & Newport, 1989; Newport, 1990, 1991; Snow & Hoefnagel-Hohle, 1978). While some explanations focus on the timing of the input, thereby suggesting a critical or sensitive period for L2 acquisition (e.g., Johnson & Newport, 1989; Newport, 1990, 1991), other explanations focus instead on the quality and quantity of input, concentrating on adult-child differences in the nature and amount of L2 experience despite similar length of time immersed in an L2 environment (e.g., Burling, 1981; Cochrane, 1977). Still other explanations focus on motivation, affective and sociolinguistic factors, and individual differences in learning rates (for reviews, see Bialystok & Hakuta, 1994; Flege, 1987; Snow & Hoefnagel-Hohle, 1978). Even today, the reason why children might be better L2 learners than adults is as hotly-debated as ever.

Whatever the outcome of this debate turns out to be, this much is clear: late L2 learners generally have difficulty acquiring native-like proficiency in the L2—especially in terms of phonology and morphosyntax—as compared with early L2 learners. Paradoxically, L2 education in the United States typically does not begin until around age 14 or 15 (high-school age), well beyond what is believed to be the end point of the critical/sensitive period for native-like language acquisition (namely age 6 or 7; e.g., Long, 1990; Newport, 1990). It appears, then, that a logical move would be to start L2 education much earlier. However, if the implementation of full-fledged L2 programs in the U.S. proves to be too expensive, even limited but regular exposure during early childhood can be beneficial for later language acquisition. That is, being around native speakers during early childhood for several hours a week can have measurable benefits in phonology for adult L2 learners (Au, Knightly, Jun, & Oh, 2002; Knightly, Jun, Oh, & Au, 2003; Oh, Au, & Jun, 2002; Oh, Jun, Knightly, & Au, 2003).

While we know that late L2 learners are at a disadvantage compared to early L2 learners, some late L2 learners nonetheless manage to become very proficient in their L2 (e.g., Bongaerts, 1999). However, it remains unclear what characteristics of typical late L2 learners predict better abilities in the L2. In this study, we will explore how various learner characteristics may be related to phonology and morphosyntax production in adult late learners of Spanish. If such learner characteristics can be readily modified at home or at school, our findings can potentially help students achieve better L2 proficiency within the current system. The adult learners in our study were typical late L2 learners in the U.S.: they had little or no exposure to the target language until their L2 classes in high school or college. We focus here on factors outside the classrooms rather than pedagogy as predictors: cultural identification, cultural participation, and motivation to learn L2. In terms of outcome variables, we

will focus on phonology and morphosyntax since these are the aspects of language that late L2 learners tend to find most challenging.

2. Methods

2.1 Overview

Adult L2 learners of Spanish were interviewed and assessed individually on: (1) Language background, (2) Identification with and participation in the Latino culture, (3) Motivation to learn Spanish, (4) Phonological production in Spanish, and (5) Morphosyntactic production in Spanish. The three learner characteristics (1-3) are used to predict the learners' productive Spanish phonology and morphosyntax.

2.2 Participants

In all, 103 adult learners of Spanish as an L2 participated in this study (21 men, 82 women). All participants were enrolled in college-level Spanish language classes and had no prior experience with Spanish until they began taking Spanish classes in high school or college.

About 240 undergraduates enrolled in second-year Spanish language courses at a university in Southern California were invited to complete a detailed language background questionnaire and follow-up interview about their experience with Spanish from birth to the time of testing, along with a Spanish language assessment battery. All participants completed a consent form and were paid for their participation. Only those participants who had no prior exposure to Spanish (including hearing and speaking), beyond perhaps hearing Spanish spoken occasionally by strangers were included in the present study¹. The vast majority of participants therefore were not of Latino/a descent (95%; 2 identified as Latino/a and 3 identified as part Latino). Independent informants who knew the participants' prior experience with Spanish (e.g., parents) confirmed the participants' self-reports.

For further corroboration, participants' knowledge of Mexican/Central American Spanish slang household expressions was assessed. Participants were asked to translate 20 English expressions (e.g., *cry baby*, *pacifier*, *dry crust in eyes*), presented one at a time on a computer screen, into informal Spanish as they would hear them at home, in the neighborhood, or in a schoolyard (Slang Production). They also heard via a headset 40 Spanish expressions (e.g., *chiqueado* meaning "spoiled child"; *las escondidas* meaning "hide-and-seek") and were asked to translate them into English (Slang Comprehension). Participants' responses were audio-tape recorded and later independently transcribed and coded by two native Spanish speakers (average agreement between coders over 95%, disagreements were resolved by a third native Spanish speaker). Participants in the present study knew fewer than 5% of the childhood slang items in Spanish on both the Slang Production and Comprehension tasks, further suggesting that their exposure to Spanish most likely began after early childhood and occurred in classroom rather than household settings. By way of comparison, adults who overheard Spanish regularly during early childhood knew about 20% of the test items; native speakers of Spanish knew about 80% of the items. (For more on the Slang tasks, see Au et al., 2002; Knightly et al., 2003).

2.3 Assessment materials & procedure

2.3.1 Learner characteristics

Participants first filled out a questionnaire packet, which included a language background questionnaire, a questionnaire on their reasons for learning Spanish, and an adapted version of Phinney's Multigroup Ethnic Identity Measure (MEIM; 1992). This study focused on the following four learner characteristics which were assessed in the questionnaire packet:

¹ Since many participants grew up in Southern California, some reported hearing people such as shopkeepers and service people speaking Spanish with others. If this was the only experience they reported, and if this experience was not on a regular basis, they were included in this study.

2.3.1.1 Identification with Latino culture

Three items assessed each participant's identification with the Latino culture:

1. How well does this describe your motivation for taking a Spanish class? "I want to feel connected to the Latino culture." (response was on a five-point Likert scale, ranging from 0 = not at all to 4 = extremely well)
2. How well does this describe your motivation for taking a Spanish class? "I want to be able to speak Spanish well with my family and other relatives" (same five-point Likert scale)
3. "I like meeting and getting to know people from Latino background" (response was on a four-point Likert scale, ranging from 1 = strongly agree to 4 = strongly disagree; note that this is an adapted item from the MEIM [Phinney, 1992]²)

2.3.1.2 Participation in Latino cultural events/activities

Six items assessed each participant's participation in Latino cultural events and activities:

- a) The following four items are adapted from the MEIM (Phinney, 1992). Responses were on a four-point scale, ranging from 1 = strongly agree to 4 = strongly disagree:
 1. "I am not active in organizations or social groups that include mostly members of Latino background"³
 2. "I don't often spend time with people from Latino background"
 3. "I don't participate in Latino cultural practices, such as special food, music, or customs"
 4. "I am involved in activities with people from Latino background"
- b) The last two items were scales that asked about participation in a variety of Spanish language activities in high school and college. These scales were made up of thirteen items each, including speaking to friends in Spanish, reading Spanish literature, and listening to Spanish radio. Responses to each item were on the following five-point scale:

0	1	2	3	4
not at all	1-3 days/month	1-3 days/week	4-6 days/week	everyday

Responses for each scale were summed to create two variables, one for participation in these activities in 1) high school, and one for 2) college.

2.3.1.3 Instrumental motivation to learn Spanish

One item asked about participants' instrumental motivation to learn Spanish, which was defined in this study as a desire to learn Spanish for its usefulness (in contrast to the previous two learner characteristics, which tap into a feeling of connectedness to Latino culture):

1. How well does this describe your motivation for taking a Spanish class? "Knowing Spanish can be very useful" (responses were on a five-point Likert scale, ranging from 0 = not at all to 4 = extremely well)

² Because we were interested in identification with Latino culture and not all of our participants were of Latino descent, we modified the MEIM items to reflect identification with Latino culture, rather than participants' own culture. Note also that on the Likert scale for the MEIM, a stronger endorsement of the items results in a lower score (since strongly agree = 1).

³ Note that in the MEIM, this and the following two items should be reverse coded. This was not necessary here, as they are used as individual items (rather than summing across items), and therefore their path coefficients will reflect their opposite scales (i.e., these should be negatively correlated to the factor if other items on the scale are positively correlated, or vice versa).

2.3.1.4 *Prior formal education in Spanish*

Number of years of formal Spanish language education was used to control for variation among participants in the amount of Spanish language instruction they had received. Participants were simply asked to report the number of academic quarters/semesters they had taken Spanish language courses since middle school. This variable was then converted to years.

2.3.2 *Spanish production assessment*

Spanish language production assessments focused on phonology and morphosyntax. All instructions and test materials were presented on either a Macintosh Powerbook G3 or 3400c/200 using PsyScope (Cohen et al., 1993), with auditory test materials presented via a headset. Participants were tested individually in a soundproof room, and their utterances were audio-tape recorded by a Marantz PMD-222 or PMD-430 professional recorder using a Sennheiser HMD 25-1 microphone. Note that tasks reported here are part of a larger language assessment battery.

2.3.2.1 *Phonological production*

Participants were asked to tell a story from a 10-page abridged version of a wordless children's picture book in Mercer Mayer's "Frog, Where are you?" series. These picture books have been used widely for eliciting narratives from children and adults in various languages (e.g., Berman et al., 1994). Prior to beginning their narratives, participants could scroll through the storybook pages on a computer for two minutes. During the story-telling task, each page was presented on the computer for 12 seconds, allowing enough time to say one or two sentences in Spanish. The audio-tape recorded narratives were then independently rated for accent by two native Spanish speakers using the following five-point rating scale: 1 = very strong foreign accent, definitely nonnative; 2 = strong foreign accent; 3 = noticeable foreign accent; 4 = slight foreign accent; 5 = no foreign accent, definitely native (adapted from Bongaerts, Van Summeren, Planken, & Schils, 1997). Inter-rater reliability was excellent (intraclass correlation = .97).

2.3.2.2 *Morphosyntax production*

Morphosyntax production was assessed with three tasks: the narrative production task just described, a noun-phrase production task, and a verb-phrase production task (see Au et al., 2002; Knightly et al., 2003 for more detailed descriptions).

2.3.2.2.1 *Narrative production*

Each narrative from the story-telling task was rated by two native speakers of Spanish (different from the accent raters) on a grammatical well-formedness scale analogous to the five-point accent rating scale, with 1 = definitely nonnative and 5 = definitely native. Again, inter-rater reliability was excellent (intra-class $R = .95$)

2.3.2.2.2 *Noun-phrase production*

Participants were asked to verbally complete five simple four-piece jigsaw puzzles designed to elicit number and gender markers (adapted from Plann, 1979). For instance, pieces in one puzzle depicted two white pianos (*los pianos blancos*: plural masculine), two white cows (*las vacas blancas*: plural feminine), one black piano (*el piano negro*: singular masculine), and one black cow (*la vaca negra*: singular feminine). Each puzzle appeared on the computer screen for 18 seconds with four puzzle pieces and a puzzle frame (showing numbered spaces for the pieces). To complete the puzzle properly, one has to correctly specify the number and gender of the determiners, nouns, and adjectives used for naming the puzzle pieces (e.g., *Pon los pianos blancos en cuatro, pon la vaca negra en tres,...* meaning "Put the white pianos in four, put the black cow in three,..."). Two native speakers of Spanish

independently transcribed the audio-taped responses and coded them for number and gender agreement. A third native speaker resolved any discrepancies between the two transcribers or coders. Percent agreement between transcribers/coders was greater than 90% for all words/codes.

2.3.2.2.3 *Verb-phrase production*

This task was adapted from Curtiss and Yamada's CYCLE test (1987), which was designed for assessing English verb morphology (tense, aspect, person, and number) production. Participants heard 20 lead-in clauses, one at a time, illustrated with pictures presented on a computer. Upon presentation of a second picture, they were asked to offer sensible completions. For instance, they might hear "*Ayer fuí a la tienda, y yo....*" ("Yesterday I went to the store, and I...") and see a picture of someone in a store. Next they would see for 6 seconds a picture of the person buying milk and were asked to complete the sentence. To be counted as an acceptable completion, appropriate morphosyntactic markers had to be used for the verb, as constrained by the lead-in clause (e.g., first person singular form in the preterite tense in Spanish in the example just given). The 20 items were created to elicit a variety of tense/aspect, number, and person markings. Agreement between the two transcribers/coders on participants' audio-taped responses was excellent (Cohen's kappas ranged from .88 to .90), and discrepancies were resolved by a third native speaker of Spanish.

3. Results

In order to explore what learner characteristics might predict L2 abilities for late learners, the data were analyzed using structural equation modeling (SEM). SEM allows for a statistical examination of various relationships among variables. It is statistically powerful because it allows for simultaneous analysis of these relationships, and because measurement error is reduced through the creation of latent variables (i.e., factors) for items that are assessed with more than one measured variable (e.g., identification with Latino culture in the present study). (For a detailed discussion of SEM, see Ullman, 2000).

3.1 *The proposed models*

Two SEM models were created for the purposes of this study; the proposed models are presented in Figures 1 and 2. Model 1 predicts participants' phonological production abilities, and Model 2 predicts their morphosyntax production. Note that in SEM, circles represent latent variables, while rectangles represent measured variables. Using EQS 6, the relationships in Model 1 between Identification with Latino Culture⁴, a latent variable with three indicators (the three items in the scale described earlier); Participation in Latino Cultural Events/Activities, a latent variable with six indicators (the items in the scale described earlier); instrumental motivation; number of years of formal education in Spanish; and phonological production (i.e., accent rating score) were examined. In Model 2, Morphosyntax Production, a latent variable with three indicators (grammatical well-formedness rating, noun-phrase production, and verb-phrase production), was included in place of phonological production.

⁴ For the sake of clarity, in this section of the paper, all latent variables are presented with initial capitalized letters and all measured variables are presented entirely in lower-case letters.

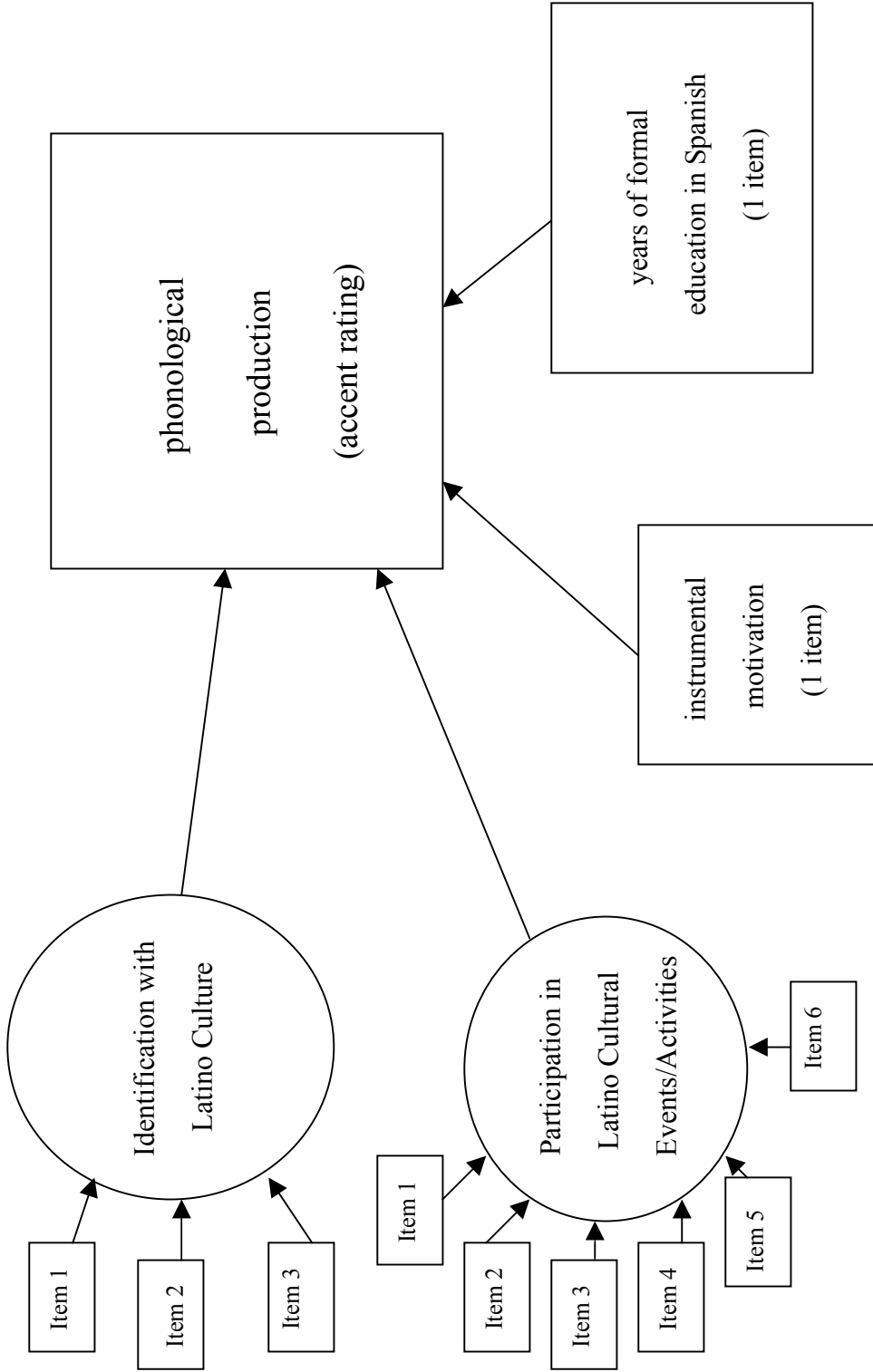


Figure 1: Proposed SEM Model 1
Predicting Phonological Production

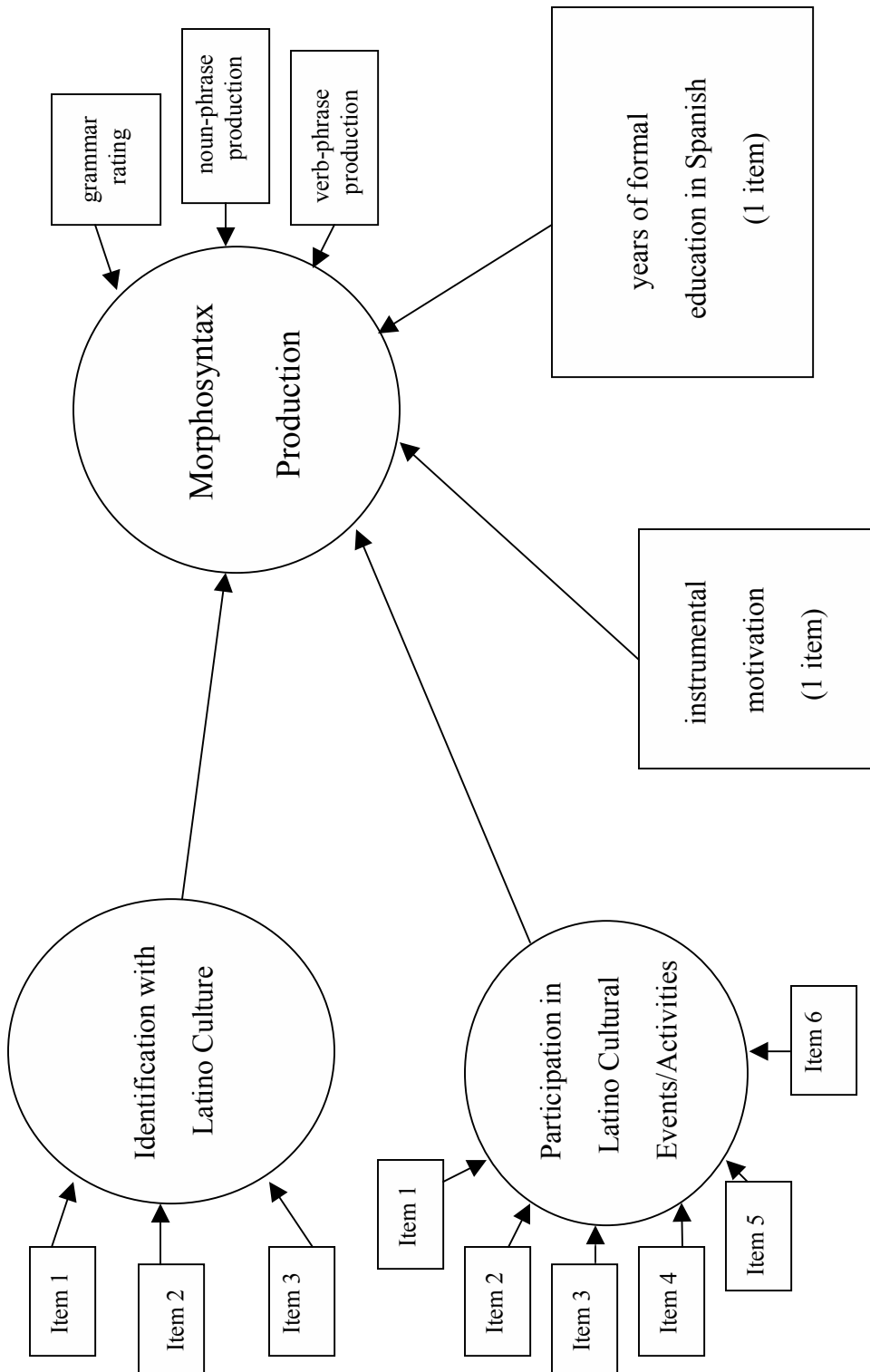


Figure 2: Proposed SEM Model 2
Predicting Morphosyntax Production

3.2 Assumptions

3.2.1 Missing data

Missing data consisted of the following: some or all of the identification with Latino culture data were missing for 5 (4.9%) participants; some or all of the participation in Latino cultural events/activities data were missing for 4 (3.9%) participants; instrumental motivation data were missing for 4 (3.9%) participants; information about the number of years of prior formal education in Spanish was missing for 5 (4.9%) participants; accent rating data were missing for 1 (1%) participant; and some or all of grammar production data were missing for 22 (21.4%) participants. All participants with any missing data were not included in the analyses. Model 1 was therefore estimated using data from 92 participants, while Model 2 was estimated using data from 73 participants.

3.2.2 Normality

Most of the measured variables were distributed non-normally. The following were distributed normally: one of the identification with Latino culture items; one of the participation in Latino cultural events/activities items; and number of years of formal instruction in Spanish. Measured variables were not transformed because these variables are expected to be distributed non-normally for late L2 learners. Therefore, robust maximum likelihood estimation, which adjusts the standard errors and provides the Satorra-Bentler scaled chi-square, was employed. All chi-squares presented in this paper are therefore Satorra-Bentler chi-squares, and all tests of significance of path coefficients are based on the robust estimation procedure.

3.3 Model estimation

Results indicate that both models fit well (see Tables 1 and 2 for model fit indices), suggesting that these background variables, as a group, are good predictors of the language abilities of late L2 learners.

Individual path coefficients for each model are presented in Figures 3 and 4. In predicting phonological production, more cultural participation by itself predicts better L2 phonology production ($p < .05$). By contrast, none of the other learner characteristics individually is a reliable predictor of L2 phonological production abilities. For Model 2, none of the learner characteristics individually is a reliable predictor of L2 morphosyntax production abilities.

Note that in both models, number of years of formal education in Spanish was included to control for any variation in abilities among our late L2 learners due to having taken more Spanish language courses. Interestingly, this variable was not reliably predictive of either phonological or morphosyntax production. Furthermore, when the path predicting language abilities from number of years of formal instruction is dropped from the models, the fit indices hardly change (phonological production: CFI = .924, RMSEA = .054; morphosyntax production: CFI = .892, RMSEA = .059). Importantly, chi-square difference tests indicate that there is no improvement in fit by including number of years of formal education as a predictor of language abilities (phonological production: chi-square difference = .15, $df=1$; morphosyntax production: chi-square difference = 2.55, $df=1$; both *n.s.*).

Table 1
Goodness of Fit Summary for Model 1

Model	df	χ^2	RMSEA	CFI
Independence	66	245.92		
Proposed	50	64.60	.057	.919
Difference	16	181.32		

Table 2
Goodness of Fit Summary for Model 2

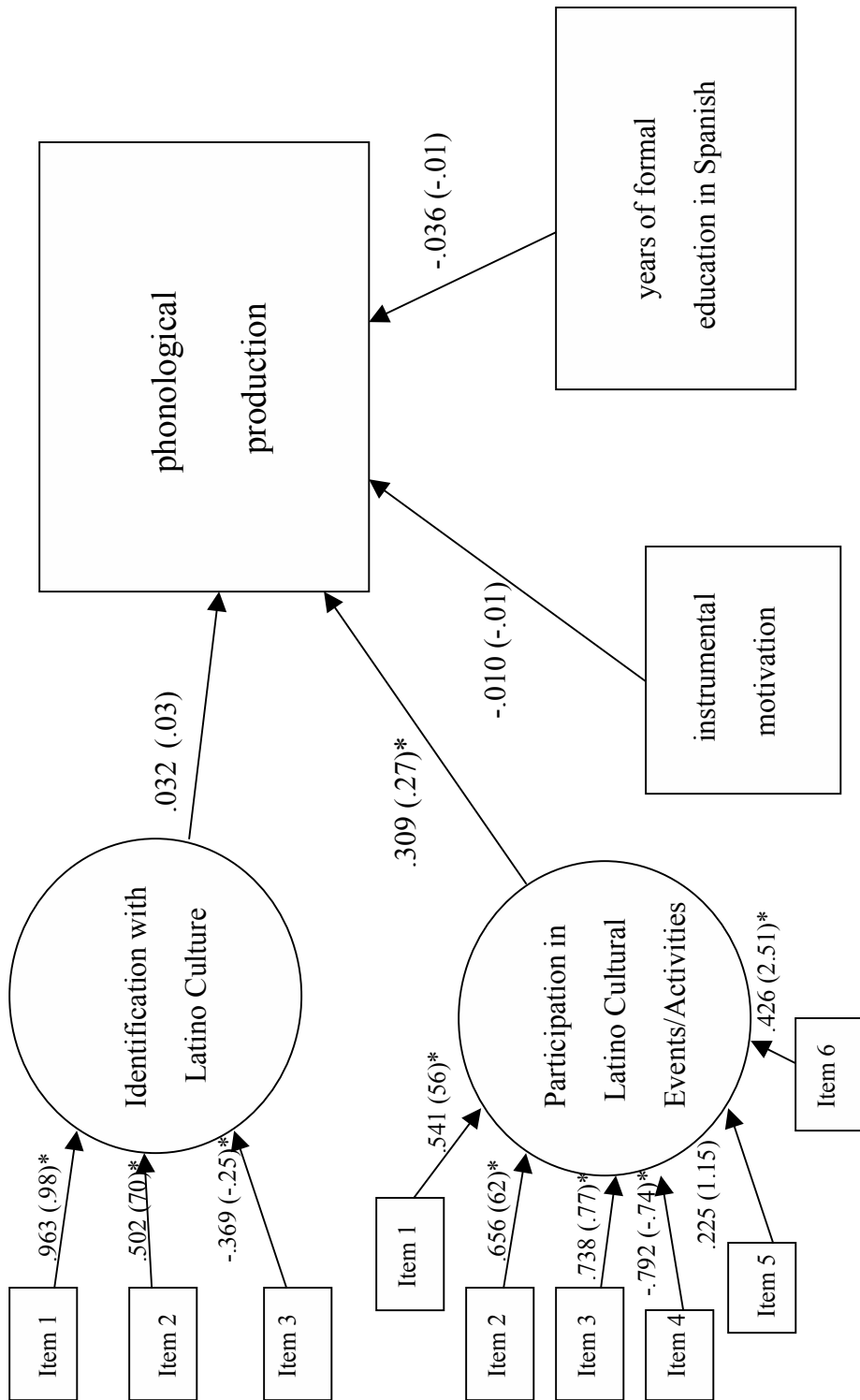
Model	df	χ^2	RMSEA	CFI
Independence	91	262.67		
Proposed	72	88.96	.057	.901
Difference	19	173.71		

4. Conclusions

In summary, it appears that the best set of predictors of Spanish phonology and morphosyntax production in late L2 learners does not necessarily include number of years of formal education in Spanish. Rather, it seems that identification with Latino culture, participation in the culture, and instrumental motivation to learn Spanish are, as a group, good predictors of language abilities for these late learners. These results, however, do not mean that adult learners' L2 phonology and morphosyntax abilities cannot be improved in classroom settings (see Bradlow et al., 1997, 1999 for findings on effective training regimens for adult L2 learners' phoneme perception and production). It is also possible that, in this study, the limited variability across learners in number of years of prior formal education in Spanish has made it difficult to reveal the true impact of this factor.

Nonetheless, our results suggest a need for rethinking the current approach to L2 education in the U.S. At the very least, it appears that those late L2 learners who participate in the cultural activities/events of Spanish-speaking cultures may turn out to have better accents than their counterparts who do not make this effort. Perhaps this type of participation helps late L2 learners put their language skills in context, and motivates them further to want to speak the language well, in order to participate more fully in these activities/events. L2 instructors at the high school and college levels may therefore want to consider encouraging their students to take part in a variety of Latino cultural events as part of their Spanish language education.

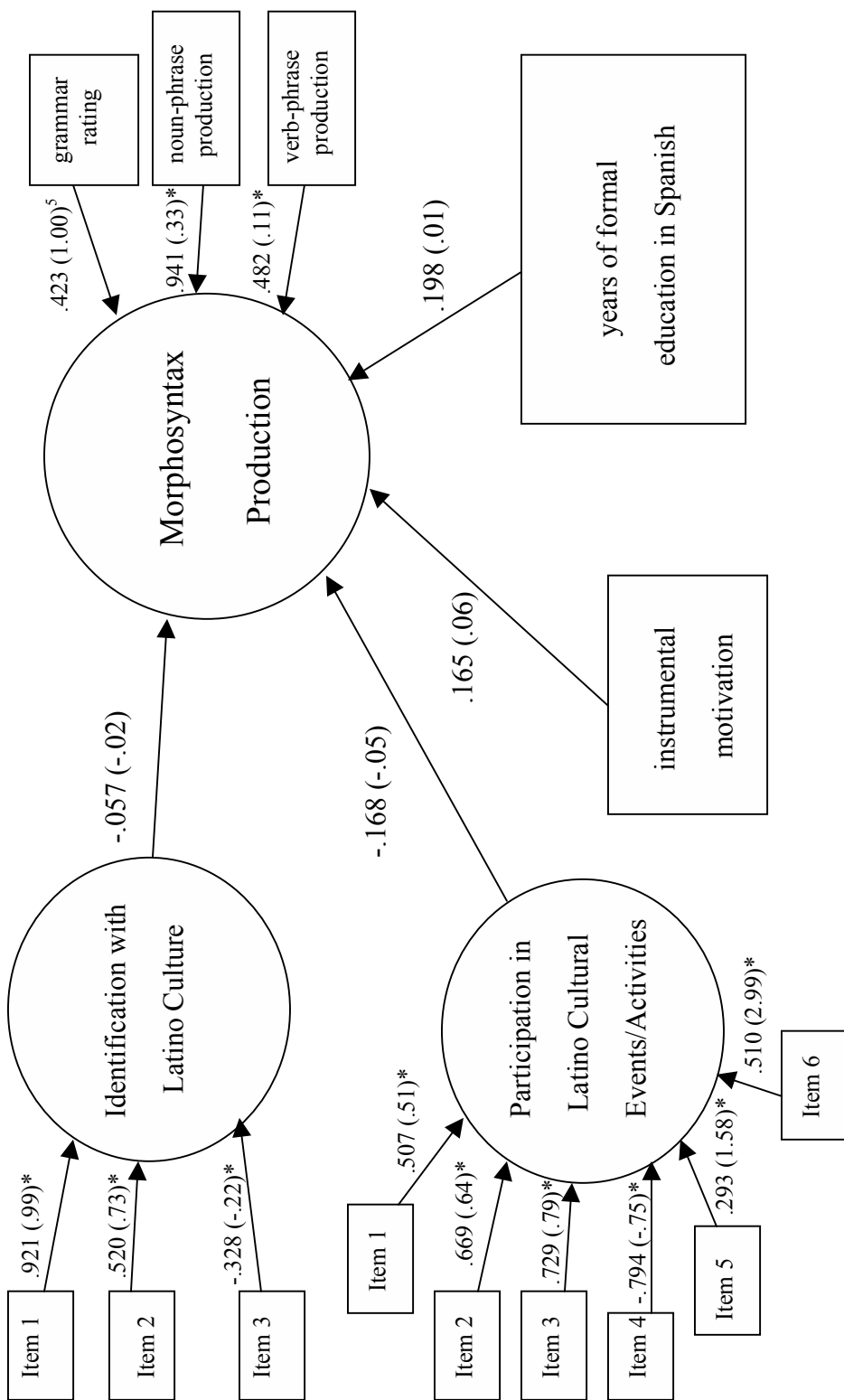
The results of this study indicate that further work is needed in order to better understand motivational factors in late L2 learners. Here, we have but pinpointed some learner characteristics that appear to be important in the late acquisition of L2 phonology and morphosyntax.



*: $p < .05$

Figure 3: Path Coefficients for Model 1

Note: For both models, standardized estimates are presented with unstandardized estimates in parentheses. Probability levels are all tested using the Satorra-Bentler modification.



*: $p < .05$

Figure 4: Path Coefficients for Model 2

⁵ Because the path to this indicator was set to one (in order to estimate the variance of the factor), it was not possible to test the statistical significance of the path.

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