Psychology and Behavioral Science
International Journal
ISSN 2474-7688

Juniper Publishers
key to the Researchers

Case Report
Volume 14 Issue 4 - March 2020
DOI: 10.19080/PBSIJ.2020.14.555894

Psychol Behav Sci Int J

A Case Report: Nationality Effect for Performance in Second Language Learners and The Influence of Stimuli for Sensorial Preferences During Learning

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Submission: February 13, 2020; **Published:** March 16, 2020

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Abstract

The Immigrant students attending schools in Portugal have different cognitive, cultural and linguistic backgrounds that might influence their inclusion process. The variables that interfere with the achievement of native children are probably different from the variables that explain the performance of immigrant students in the same schooling years. In a brief case report, we present an analysis of the impact of specific variables for the individuals' performance and a theoretical discussion on the learning and sensorial preferences of a sample of over one hundred immigrant students, assessed in a previous empirical study with second language tasks. Through a confirmatory factorial analysis, the nationality showed to be a mediating factor in models where, simultaneously, other factors emerge with lower predictive value for the children's performance in the same tasks. Concerning the theoretical discussion and literature review, we support that auditory discrimination tasks, more than visual discrimination tasks, with words and nonwords as stimuli, could improve the differential diagnostic test for the specific minorities in European schools. Auditory tasks are indicated for children from the European, American and African continents and visual tasks are more suitable for children from Asian countries, mainly from China.

Keywords: Case report; Psycholinguistics; Second language; Nationality; Sensorial preferences

Introduction

In a second language context, learning styles and sensorial preferences for learning are related to cognitive strategies. Cognitive strategies are addressed as ways to store and recall information encoded in two or more sources: L1 and L2. The decoding methods – bottom-up and top-down – are used in conflict by participants in studies concerning their need to understand stimuli and information in the new language [1-3]. The top-down method – based on the students' prior knowledge and context-based – is the least used according to the previously mentioned studies and the bottom-up approach favours listening comprehension [4]. To infer from the context is commonly experienced as being more difficult than the strategies of decoding by units, focusing on the text only. On the other hand, some authors, Brunfaut & Revesz [5] found that lack of attention and recall for listening tasks are frequent when performed by L2 learners. There is not enough data regarding age as a variable to explain recall and attention during second language testing. Correlated to the listening comprehension skill and the recall competency, the dichotic hearing test is another measuring context that helps determining how the control inhibitory system of L2 learners and bilinguals work [6], as well as how they are susceptible to using orthographic sources correctly (from L1 and L2) considering the binaural dichotic input [7]. The language computation is attained through a diverse trajectory as there are different proficient learners and different minorities in this type of tests. Besides the neural mechanisms involved and the implication for the educational explanation about the auditory discrimination, the dichotic listening test is widely used in native and non-native individuals for different purposes. In the case of L2 learners, the main goal is to examine how learners retrieve words in order to identify the words and nonwords in the binaural input. Previous studies reported cross-cultural effects for discrimination

of nonwords in tests using two groups of minorities, including Portuguese [8]. In the present case report, the statistical data only focused how specific sociodemographic factors (individual' differences) the L2 performance, then we discuss theoretically the impact of cognitive and sensorial preferences for learning in a L2.

Case Report and Discussion

A brief confirmatory factorial analysis (CFA) was conducted to clarify the mediated effects, direct or indirect, produced by nationality as an independent variable over performance and concerning over independent variables such as home language and socioeconomic status. We ran the CFA to test a model with all the tasks from a tests' battery, (Figueiredo, Brandão & Nunes (2019)) in order to determine which variables, have direct or indirect moderator effect on the tasks' performance of the minority groups [9]. The main goal of this brief CFA was to understand which main causes condition the children's achievement in the different tasks. Here we used only the data concerning the nationality as the independent variable and three tasks (not including dichotic hearing measure) as dependent variables. Despite the school variable having strong indirect effects that explain how schools moderate the effect of other factors such as nationality (r = -.284, p = .025), it was verified that home language, but not socioeconomic status, was related to the tasks' performance only when Nationality emerges as a mediator variable (χ^2 = 208.72, with *df* = 36 (*p* = .000); CFI: 1.0; RMSEA = .21). A summary of fit indices and χ^2 difference tests for moderation effects are shown in Figure 1 & Table 1.

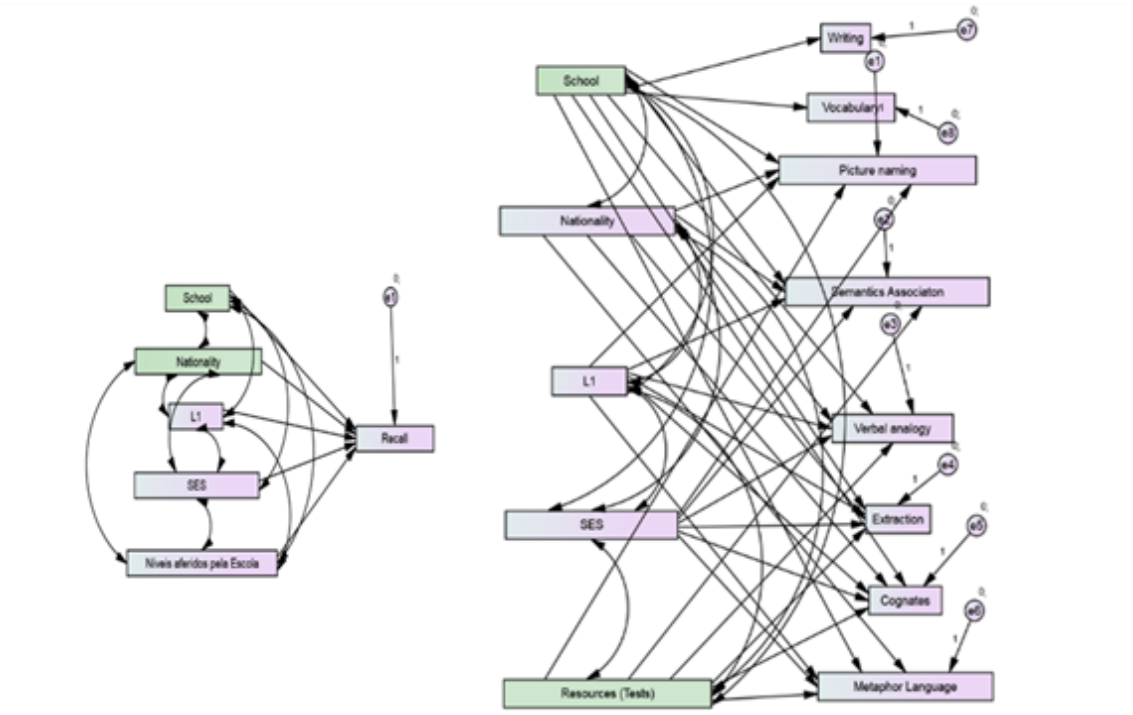

Figure 1: Path analyses and covariance values of Confirmatory Factorial Analysis: nationality mediating effect for the students' performance in picture (naming and phonemic) recognition and auditory discrimination (recall) tests.

Table 1: Estimate value for the causal relationships observed.

S.E.: Standardized Estimates; C.R.: Composite Reliability; P: Pearson value, significant if >.05 [9].

Covariates			Estimate	S.E.	C.R.	*P*
School	<-->	**Nationality**	-1,311	,535	-2,449	,014
School	<-->	L1	-1,623	,502	-3,236	,001
School	<-->	SES	-,374	,308	-1,214	,225
School	<-->	Tests resources	,153	,339	,452	,652
Nationality	<-->	L1	1,784	,297	6,003	***
L1	<-->	SES	,247	,151	1,634	,102

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L1	<-->	Tests resources	-,108	,192	-,562	,574
Nationality	<-->	SES	,307	,165	1,862	,063
SES	<-->	Tests resources	-,053	,107	-,491	,624
Nationality	<-->	Tests resources	,079	,210	,377	,706

The confirmatory factorial analysis provided additional evidence for the nationality's predictive value in the immigrants' performance in the four L2 tasks, and mediated effect for other variables pertaining to these children' background (L1, for example). The analysis of variance revealed the participants' detailed achievement regarding the nationality effect. Previous research [10] highlighted that new language learners, mainly bilingual ones, frequently outperform their monolingual peers in problem-solving strategies and in the auditory listening input. This study revealed that specific ethnic groups were successful in specific nonwords and words recognition. Chinese students performed lower compared to the other minorities. In general, their condition as L2 learners will lead them to develop inhibitory control mechanisms that are an advantageous strategy for the dichotic hearing tasks. Dichotic listening is one of the tasks that determines how stimuli variance (words and nonwords) can explain the variability of achievement in L2 late learners [11]. Dichotic listening and figure decoding tasks involve different amounts of attention in bilingual, L2 or monolingual learners [11,12]. These recent studies indicate how it has become necessary to change assessment policies for specific learners. The research goal is to change assessment for specific groups of immigrant learners. Besides the cultural and nationality factors, and yet related to them, Chateignier, Dutrévis and Nugier [13] advanced other variable: cognitive mapping and the strategies involved. In fact, cognitive previous experience determines the agility of individuals towards specific stimuli. In this study, we suggest that the main strategies of Asian, mainly Chinese, and of Eastern Europeans, depend on their home language alphabet. There is an enormous linguistic distance between Mandarin, for instance, and a romance language as target language, such as Portuguese, and this may be an obstacle to auditory decoding. Other obstacle would be the type of stimuli, figures or other, used in the tasks [12]. When focusing on figures and pictures, visual decoding may diminish their cognitive load required for those listening tasks.

The results offer a new insight about that difference, with consequences on the design of tasks and respective audiences. Past studies examined the type of tasks but from other perspective: forms of instruction mostly in foreign language learning [14] and bilingualism [15]. Picture naming (vocabulary retrieval tasks using pictures) is viewed as an easier task than other type of evaluation measures for second language and bilingual learners [15,16]. In the case of bilingual learners, there is a high probability of existing low frequency vocabulary assisting the learners' language retrieval process during the task. Visual stimuli in naming tasks should be according to the high lexical frequency considering the vocabulary in the target language (L2). Moreover, as previously seen with these data, the naming tasks are less demanding from a cognitive perspective than the recall tests and translation tasks (word retrieval). The naming process is easier for less fluent bilingual learners than the translation task [17] and older studies have established that printed stimuli, in a vocabulary evaluation context, are more important for decoding than other stimuli for bilingual and L2 [18]. Additionally, it has been proved that individuals are likely to benefit more from visual discrimination tasks than from auditory discrimination tests [19]. Holcomb, Coffey & Neville [20] noted that auditory and visual processing for language decoding may vary and that the age effect increases the listening difficulties. This study examined those differences and difficulties according to different groups of L2 learners, but the age factor did not significantly influence the participants' performance in the four tasks.

Different minorities in the same classroom would benefit from different strategies that would be firstly examined through visual and listening tests. After the results (of a first assessment) establishing the main difficulties of specific minorities, listening or picture tasks might be given to the different groups of learners. There is no productive approach to learning if the listening skills are low and the current tasks focus on images and vice versa [3]. On the contrary, there is substantial knowledge, but in English as L2, provided by past research [21] about how individuals perform in second language and foreign language when the stimuli are presented in different forms, such as auditory. Proficiency is the main variable that affects the stimuli processing. In line with this thought, we advance that the proficiency of L2 learners may be properly assessed through auditory tasks. Despite being easier for strategy activation, visual discrimination tasks are not expected to provide valid information on the learners' proficiency. Auditory discrimination could accurately differentiate the learners' language gaps [22], but other studies have demonstrated that auditory input as form of instruction is not more effective for L2 learning, unlike the visual cues [5].

Conclusion

This study has specific limitations that need to be analysed. First, despite the main concern to select only specific groups of participants (not volunteers), the variability of answers and differences in the cultural groups should be further examined

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with larger samples to account for the cultural aspects. Second, larger samples would benefit a more focused and rigorous CFA in that the model fit indices would be more accurate with a higher number of participants. Additionally, refugee children should be included to compare achievement and decoding differences depending on mobility distinct causes. Further studies should also examine the learning styles in terms of sensory preferences of immigrant young students by including tasks like those presented in this study.

This study stresses that auditory discrimination tasks, more than visual discrimination tasks, with words and nonwords as stimuli, could improve the differential diagnostic test for the specific minorities in European schools. Auditory tasks are indicated for children from the European, American and African continents and visual tasks are more suitable for children from Asian countries, mainly from China. These are contributions for a set of guidelines to be developed for a new adjusted model more in accordance with the educational challenges of the diversity of immigrant school population. Those guidelines, based on previous validated work that distinguishes the type of tasks and input for each minority, may replicate the guidelines for evaluation of minorities and ethnic groups established by the American Psychological Association [23]. According to the APA guidelines and to the studies of Kim, Park & La [24] on ethnic minorities, the Hispanic population is frequently at risk in terms of educational needs and development. However, in this study the Hispanic population did not have low scores and thus it is not part of an educational risk group in Portugal. The current generation of immigrants and refugees in contexts other than the American require new reference frameworks that go beyond language assessments.

Acknowledgment

This work was supported by the Psychology Research Center (CIP) of Universidade Autónoma de Lisboa, Luís de Camões (UAL), CIE (Center for Education Researh) of ISPA- Instituto Universitário and by the Foundation for Science and Technology (FCT), Lisbon, Portugal.

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