Leveraging Home Languages to Promote Executive Functioning: An Examination of Influences and Outcomes

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Project Description.
Executive functioning (EF) is a set of processes that all have to do with managing oneself in order to achieve a goal (Miller & Cohen, 2001).

Past research indicates that bilinguals have a cognitive advantage over monolinguals, especially in performing non-verbal EF tasks. For young Spanish-English dual language learners (DLLs), the role of language dominance and language loss in the development of EF is unclear—it is not known to what extent various levels of language dominance might influence the cognitive benefits of bilingualism.

Previous research following a sample of immigrant Dominican and Mexican children from ages 2 to 5 identified four dual language profiles: a) Dual-language growth, b) English dominance, c) Spanish dominance, d) Change from Spanish to English dominance (Escobar, & Tamis-LeMonda, 2017). The authors provide insight into possible environments that predispose children to belong to a particular group. Children in the dual-language growth group showed relatively even gains in both languages "likely reflecting strong support for the use of English and Spanish in their home environments" (Escobar, & Tamis-LeMonda, 2017, p. 96). Children experiencing English dominance showed uneven gains with a greater increase in English scores as compared to Spanish scores "likely reflecting predominantly English inputs at home, despite the immigrant status of their parents" (Escobar, & Tamis-LeMonda, 2017, p. 96). Children in the Spanish dominant groups produced uneven gains with a greater increase in Spanish scores as compared to English scores "most likely representing the types of language development seen in children of recently immigrated parents (Escobar, & Tamis-LeMonda, 2017, p. 96). The final group showed gains in English production and a reduction in words produced in Spanish, displaying possible first language loss. "This profile of change is likely to be most common for many children of immigrant parents as they are increasingly exposed to English in the host country, particularly at school" (Escobar, & Tamis-LeMonda, 2017, p. 96).

While these groups are informative, the method used to collect these data cannot feasibly be implemented on a large scale, or on a tight budget. The current project will test the effectiveness of using receptive language scores to achieve similar results. Additionally, research that shows that EF relates differently to relative "amounts" of bilingualism would be useful on many levels.

Research Questions

1. Will a growth mixture model using DLL's receptive vocabulary change scores detect the same number and nature of classes as has been observed using longitudinal expressive language counts?

2. What influence does experiencing change from Spanish to English dominance (i.e., experiencing first language loss) have on EF abilities as compared to children who experience other patterns of growth?

3. What influence does experiencing dual-language growth have on EF abilities as compared to experiencing English or Spanish dominance growth patterns?

Sample
The Family and Child Experiences Survey (FACES):2009, is a longitudinal study of Head Start classrooms, children, and families following 3-year-old children from the beginning of their first year in a Head Start classroom until the end of their kindergarten year. Children from Spanish speaking homes, who were three years old in the first wave of

FACES:2009 data collection have been selected for analyses.

Methods

Research question one will be addressed by conducting a growth mixture model using scores of DLL's receptive Spanish and English vocabulary. Growth mixture modeling is an exploratory method useful to identify and describe unobserved subpopulations in longitudinally collected datasets (Ram, & Grimm, 2009). Often, data are collected from distinct groups, such as males and females. However, in many cases, groups cannot be directly observed. For example, a group of DLL students in a Head Start classroom may exit with differing levels of proficiency in each language. Some may seem to be able to communicate effectively in both languages, while others seem to prefer one language over the other. However, membership to one of these groups is not as clearly defined as gender may be. Growth mixture modeling is capable of modeling the unobserved groups present in the population. Based on previous research (Escobar & Tamis-LeMonda, 2017) it is anticipated that four unobserved groups, or patterns, of dual language development exist.

Research questions two and three address how these unobserved groups may have important repercussions for later EF development. Both questions will be answered using multilevel modeling, an analytic technique equipped to account for the clustering of scores within classrooms, to investigate the influence of different patterns of language development on EF. It is expected that children who experience first language loss will have lower EF scores than children experiencing any other pattern of language development. Additionally, it is hypothesized that children who experience relatively even growth in both languages will produce greater EF scores than those who primarily develop proficiency in a single language.

Implications for Policy/Practice

Results may encourage those who interact with DLL students to place renewed focus on developing more advanced levels of bilingualism in order to reap the potentially greater associated EF benefits. Current teaching practices improve through greater understanding of a child's bilingual development.

Creating connections between patterns of language learning and traits essential to academic readiness will instill new meaning to daily teacher-child interactions and provide the basis for more intentional support for a variety of levels of bilingualism.

Understanding the potential influence of language loss and attrition on EF development may add new meaning to current policies and practices that value first language maintenance. These findings may also highlight the critical need for additional first language supports for DLL students.

Implications for Research

Findings may lend further evidence to theories identifying a domain general mechanism for EF that is "strengthened" through repeated practice of being bilingual.

Methodologically, findings may provide evidence that there is a need to require more thorough description of the proficiency levels of bilinguals included in future research investigating other aspects of the EF-bilingualism connection.

Practically, findings may validate a method to identify patterns of bilingual vocabulary development in a young low-income population. The development of a cost-effective method for assessing the dual language patterns for DLL children will be useful for Head Start programs as they track progress towards goals and support children in their current developmental needs.

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