

# Effect of Spanish Two-Way Immersion Programs on Kindergarten Students' Attitudes: A Study of Treatment and Control Schools

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## Abstract

A Spanish two-way immersion program is a dual language program in which instruction is provided in Spanish and English to native English speakers and native Spanish speakers. The languages of instruction are kept separate and students are grouped heterogeneously. This study was conducted with kindergarteners after their first year either in a Spanish TWI or a traditional program. The study was conducted in two rural and two urban schools in a Midwest state, with a sample size of 114 students distributed unequally through the schools. The children were asked to answer a 14-item survey about their attitudes toward school and learning. A generalized mixed multinomial linear model analysis revealed that TWI programs were associated with significantly more positive effects on the kindergarten students' attitude toward the Spanish language in comparison to their peers in control schools.

**Key Words:** Generalized mixed multinomial linear model; Survey for children ; Dual Language Education

## 1. Introduction

In the United States, two-way immersion (TWI) programs are defined as an educational approach that integrates native English speakers and native speakers of another language (typically Spanish) for content and literacy instruction in both languages (Howard, & Christian, 2002). This educational model has been referred to in the literature as two-way immersion (bilingual) programs (Howard & Sugarman, 2001; Thomas & Collier, 2002; Lara-Alecio, Galloway, Irby, Rodríguez, & Gómez, 2004; 2-Way CABE, 2005), two-way bilingual education programs (Christian, 1994; Ovando, Collier & Combs, 2003; Crawford, 2004), two-way dual language programs (Texas Two-way Consortium, 2005), and dual language education programs (Dual Language Education of New Mexico, 2005). There are two main program models in TWI education. These are generally referred to as “50/50” and “90/10,” which indicates the percentage of instructional time given to each language during instruction (Howard, & Christian, 2002).

The National K-12 Foreign Language Resource Center (NFLRC), located at Iowa State University, is one of 15 Language Resource Centers in the nation federally funded by Title VI International Education, U.S. Department of Education. The NFLRC, which was established in 1994, collaborates with the Center for Applied Linguistics in Washington (CAL), DC. In the current grant-funding period (2006-2010), the NFLRC focuses its work on elementary school Chinese programs (non-intensive model) and Spanish Two-way Immersion programs (intensive model). This work involves providing professional development for teachers, designing curriculum, supporting program development, and conducting longitudinal research that includes both treatment and control schools. The research examines English-speaking students' progress in Chinese and Spanish language proficiency; attitudes toward the Chinese and Spanish language and cultures of students, administrators, teachers, staff, and parents; and, student progress on standardized assessments of English language arts and mathematics as compared to the progress of control groups.

This paper reports the effect Spanish two-way immersion programs had on kindergarten students' attitudes toward the Spanish language in two treatment schools, as compared with the traditional curriculum in two control schools. Treatment and control schools were matched by size, percentage of students eligible for free/reduced price lunch, ethnicity, and school urbanicity.

## 2. Data Collection

### 2.1 Experimental Design

During the period 2006-07, four Midwest schools were chosen to participate in the study. The two treatment schools were chosen by the State Department of Education. The program of instruction given to the beginning kindergarten students in these two treatment schools is Spanish two-way immersion. These TWI programs are similar in context

and content for both schools. One of these schools was a K-8 building on a K-12 campus in a very small rural town. The second treatment school is located in a medium-size city and has an enrollment of over 600 students K-5. Each one of these treatment schools was matched with schools delivering traditional programs located within the same district. The criteria used to match the schools included the following characteristics:

- Size of the schools defined by the number of enrolled students the year prior to the initial year of the project.
- Percentage of students eligible for free/reduced price lunch in each school, which is often used as a measure of the economic well-being of the child's family. (Cruise & Powers, n.d.).
- Distribution of the percentage of ethnicities in each school. Ethnicity is defined as the identity with or membership in a particular racial group (APA).
- School urbanicity refers to the geographic location of the school: rural or urban.

In each of the schools involved in the study, parents/guardians were invited to sign a consent form, approved by the Institutional Review Board at Iowa State University, to allow their child to participate in the study. Out of 161 students, consent was received for 131 students. Of these 131 students, 114 were surveyed with the student attitude survey. However, because some of these children were bilingual they were excluded from this analysis. The following table clarifies the distribution of students by language dominance and role of the school in the study.

**Table 1:** Distribution of Home Language among Schools

Home Language	School				Total
	Treatment 1	Control 1	Treatment 2	Control 2	
English	14	16	10	17	57
Spanish	24	0	17	8	49
Total	38	16	27	25	106

## 2.2 Student attitude survey

In the spring of the first year of the study (2006-2007), kindergarten students completed a 14-item paper survey administered by project staff in their grade-level classrooms. In treatment schools, the survey was provided in Spanish or English, depending on the language dominance defined for students by their parents/guardians in a home language survey completed at the beginning of the academic year. In treatment schools students were grouped for the survey by language dominance. Because all instruction in control schools was in English, the survey was administered in English to all students. After providing a sample test item for students to score, project staff read the survey statements to the students, who colored in their response to each statement from among three choices: an unhappy face, a neutral face, a happy face. These faces were designed to indicate the students' level of agreement with the statement read to them. An unhappy face indicates "not true," a neutral face indicates "neither true nor not true," and a happy face indicates "true." The time needed to finish the survey was approximately 15 minutes for all students

## 3. Data Analysis

The data were analyzed by considering three specific questions included in the survey:

- I like Spanish
- I like English
- Learning to read and write in Spanish is important.

A generalized mixed model was used to analyze the data. The responses possible for each question correspond to categorical variables, so the distribution considered for this model was a multinomial distribution with cumulative logit link function.

Fixed effects were estimated for the following factors:

- Program: TWI program or traditional program;
- Home language: English or Spanish.

For random effects the district and the school where the school is situated were identified. Therefore, the model proposed is:

$$Response_{ijklm} = Intercept + Program_i + Home\ Language_j + District_k + School_l \quad (1)$$

where  $District_k \sim iidN(0, \sigma_k^2)$ ;  $School_l \sim iidN(0, \sigma_l^2)$ ,  $i = 1,2$ ;  $j = 1,2$ ;  $k = 1,2,3$ ;  $l = 1,2,3,4$ ;  $m = 1, \dots, 106$

### 3.1 I like Spanish.

The responses of students to this statement indicate that in both types of schools (where there is a traditional program of study and a TWI program) there is, in general, a positive attitude toward Spanish. The following table clarifies the response distribution by type of school.

**Table 2:** Distribution of Responses to the Phrase “I like Spanish.” (in Percentage)

Program	Response			Total
	No	Neither Yes or No	Yes	
Traditional	34.1	22	43.9	100
TWI	9.2	12.3	78.5	100
Total	18.9	16	69	100

Based on the results of the model, the only factor affecting the students’ responses to “I like Spanish.” is the program of study (traditional or TWI). Participating in the TWI program is associated with positive attitudes of kindergarten students ( $p=0.03$ ) to this statement. Based on this model, it is expected that 75.43% of kindergarten students in TWI programs will have a positive attitude toward Spanish; 7.4% are expected to have a negative attitude toward Spanish; and 17.17% are expected to be indifferent.

### 3.2 Learning to read and write in Spanish is important.

Results from the survey indicate clearly that students in kindergarten have the notion that to write and read in Spanish is important, as Table 3 illustrates.

**Table 3:** Distribution of Responses to the Phrase “Learning to write and read in Spanish is important.” (in Percentage)

Program	Response			Total
	No	Neither Yes or No	Yes	
Traditional	35	2.5	62.5	100
TWI	6.3	9.4	84.4	100
Total	17.3	6.7	76	100

The program of study (traditional or TWI) is significantly related to the response of kindergarten students to “Learning to read and write in Spanish is important” ( $p=0.03$ ), when model (1) is used. Based on this model, it is expected that 80.4% of the kindergarten students in TWI programs will have a positive attitude toward the phrase; 7.8% are expected to have a negative attitude; and 11.8% are expected to be indifferent.

### 3.2 I like English.

Most of the students participating in both types of programs have very positive attitude toward the English language, as Table 4 indicates.

**Table 4:** Distribution of Responses to the Phrase “I like English.” (in Percentage)

Program	Response			Total
	No	Neither Yes or No	Yes	
Traditional	9.8	4.9	85.8	100
TWI	7.8	9.4	82.8	100
Total	8.6	7.6	83.8	100

By using the proposed model, the program of study is not associated with students’ attitude toward English.

## 4. Limitations

Limitations of this study include the relatively small number of students participating in the attitude survey ( $n=106$ ) and the fact that the participants are kindergarten students, for whom measures of attitude are challenging. In constructing the instrument, however, the researchers consulted with kindergarten teachers and piloted the study with young children. Because they administered the survey in small groups of students, they were able to clarify for students that the responses marked related to the questions read to them by the researcher. Replication of this study

is planned throughout each year of the four-year longitudinal study, therefore allowing for these results to be compared with other kindergarten students in TWI programs and with older students.

## 5. Importance of the study

Language-minority students are not immune to how the ethnic majority views them. One study found that, on a survey of immigrants regarding what they perceived to be others' attitudes toward themselves, over 65% of the respondents had negative associations of what others thought of them (García, 2004). Immigrant youth of color indeed perceive that many in the dominant culture do not like them or welcome them. This "social mirroring" can be potentially harmful; it can also perhaps explain the current phenomenon revealed in a National Research Council meta-analysis cited by Suárez-Orozco, Suárez-Orozco, and Doucet (2004) that the longer an immigrant has resided in this country, the poorer their physical and psychological health. In addition, increased time in this country is also associated with lower academic achievement, despite gains in English proficiency over that same period of time.

The use of a generalized mixed linear model assuming multinomial distribution for the response and cumulative link function is a very new tool used in Foreign Language Education research. By using this type of statistical tool we expect to contribute to the possibility that the researcher in this area go beyond basic statistics.

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