

The Effect of Singing Paired with Signing on Receptive Vocabulary Skills of Elementary ESL Students

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The purpose of this study was to determine the effect of singing paired with signing on receptive vocabulary skills of elementary English as a Second Language (ESL) students. Eighty children attended language sessions in one of the following rehearsal conditions: sung text paired with signs, spoken text paired with signs, sung text, and a control group of spoken text only. Pretest and posttest data were analyzed to determine gains in receptive vocabulary identification. Results from this study indicate that all four groups made significant pretest to posttest gains. Children in the sung text paired with sign and the spoken text paired with sign conditions, however, made significantly greater gains in vocabulary recognition than those in the control condition of spoken text only. These findings suggest the benefits of integrating signs into second language rehearsal to provide visual cues and to engage students in meaningful physical participation. The condition yielding the highest mean gain score was that in which signing was paired with singing, indicating there may be advantages to using a combination of the two for language acquisition.

The number of children who are limited English proficient (LEP) attending U.S. public schools is rising. A report from the U.S. Department of Education (Macías & Kelly, 1997) showed the number of LEP children increased annually from 1990 to 1995. For the 1994 to 1995 school year, LEP enrollment rose to 3,184,696. Immigrant adults who transplant their families to American soil are often seeking enriching educational and occupational opportunities. Often, however, they find their successes defined by their language abilities or limitations. For these youth, immediate language acquisition is critical for academic, social, and economic integration.

Academic challenges for children learning English as a Second Language (ESL) differ from those of native English-speaking stu-

dents in that there is prerequisite learning that must occur in order for immigrant students to acquire comparable grade-level knowledge and experience. Comprehension and accurate expression of English words are not only important for communicating thoughts, feelings, and needs, but these skills are essential for appropriating new information. In light of this need, combined with the issue of enrollment trends indicating steady growth in the number of LEP students in U.S. public schools, expectations for educational reform and for productive outcomes are steep. This requires immediate development of innovative teaching strategies that can foster highly accelerated learning of core vocabulary in order to facilitate all other learning

Music has become a valued tool in theoretical design and practical application of English-as-a-second-language instruction. There are cognitive functions common in processing both language and music that are necessary for second language acquisition. According to Krashen (1983), language "acquisition" differs from language "learning" in that the former is a subconscious internalization of language, and the latter is the conscious mastery of language rules. Thus, in acquiring a new language, natural processes occur in the mind without learner awareness. One of these, which is central to the claim that songs intrinsically reinforce language acquisition, is known as the Din phenomenon.

Krashen (1983), referring to the phenomenon as "Din in the Head" (p. 41), was the first to formally label this involuntary language rehearsal. Although considered a spontaneous cognitive process, the educational functions of this intriguing phenomenon can be actively maximized. An investigative survey conducted by de Guerrero (1987) indicated that ESL students at all levels of English proficiency engage in subconscious Din rehearsal. Further, the study revealed that Din has positive practical and emotional effects on the language student, including "additional practice in the language" and "greater confidence in speaking the language," which will help them to "become less afraid and more desirous to use it" (p. 544). Awareness of these benefits enables teachers and students to transfer some aspects of mental rehearsal to voluntary learning. "Sounds, words, phrases, and sentences of the second language may suddenly pop out—even without the presence of any stimulus—and ring insistently in the student's head, or may be deliberately retrieved, repeated, ana-

lyzed, and associated with certain situations” (p. 544). The function of this mental rehearsal of spoken language is analogous to that of audiation, “hearing” music in one’s mind, for cognitive rehearsal of music.

The relationship between involuntary mental rehearsal—“Din in the Head”—and music-assisted language acquisition was suggested in two articles by Murphey (1990, 1992). “Song may act as a LAD [Language Acquisition Device] activator, or be a strategy of the LAD in the ontogenetic development of language” (Murphey, 1990, p. 53). “The L2 [second language] research question is whether music and song can trick the LAD into a Din mode that would process more communicative speech” (Murphey, 1992, p. 773).

Murphey (1990) expanded on Krashen’s (1983) Din theory by conceptualizing the song-stuck-in-my-head (SSIMH) phenomenon. He equated the experience of having a song or part of a song running through one’s mind to that of hearing inner speech, also known as Din. Of 49 Swiss people surveyed in a pilot questionnaire, all respondents reported having experienced SSIMH. Murphey explained that, like Din, SSIMH is involuntary language rehearsal. In contrast to Din, however, which some have suggested might require a couple of hours of language input, the onset of SSIMH can occur after a few minutes of song exposure. Based on the commonness of the SSIMH experience and the ubiquity of English-language music, Murphey concluded that popular songs can facilitate language acquisition

The controlled application of songs to achieve specific goals in second language instruction is indicated in the literature by practitioners and researchers. Songs can effectively “reinforce teaching by helping to practice and revise vocabulary, idioms, sentence patterns, pronunciation, stress, rhythm, and intonation in a variety of language styles, and offer background cultural information . . . without recourse to barren drill” (Rees, 1977, p. 226) The analysis of melodic and rhythmic elements of songs can aid ESL students’ language comprehension (Sheeder, 1976). Music can provide intonational cues to improve the speech prosody of non-native speakers (Staum, 1987). Working with international students enrolled in two university intensive English programs, Staum found that pairing melodies with English sentences, as compared to using spoken English sentences, significantly increased the accuracy in verbal inflection for these second language learners.

The incorporation of songs into ESL education is one progressive step toward achieving a multisensory approach to language development. Even so, other compatible sensory stimuli must be employed to provide the optimal language environment for the highly-accelerated learning of core vocabulary in children studying English as a second language. Although the instructional resources often used by teachers are pictures or three-dimensional objects, visual aids are not limited to tangible materials. Mime or physical actions provide live modeling to connect the spoken and heard word to an image. Total Physical Response (TPR), a well known technique in the field of teaching English as a second language, involves active participation of students who learn new action words by watching and imitating as the teacher says and physically demonstrates each word; this facilitates more rapid comprehension and better retention of vocabulary. Richards (1975) asserted that it is clearly better to use actions paired with pictures than merely to translate English words.

Physical conveyance of language—including mime; facial expressions; body posture; and hand shape, position, movement, and direction—can be achieved through the use of American Sign Language (ASL). According to Baker-Shenk and Cokely (1991), “movements and shapes serve as the ‘words’ and ‘intonation’ of the language” (p. 48). American Sign Language is “a *visual-gestural* language created by Deaf people and used by approximately 250,000–500,000 Americans (and some Canadians) of all ages” (p. 47). The characteristics of ASL, identified by Baker-Shenk and Cokely as what makes it an effective medium for communication, include iconic representation of symbols, focal point of signing space around the mouth where speech can be seen, and development of language to allow ideas and objects to be seen. For many deaf children, ASL is the language base on which English can be learned (Magrath, 1985; Quigley & Paul, 1984; Swisher, 1989). As a result, signs are already a part of the language curriculum for that particular subgroup of ESL students.

The point at which cognitive, oral, aural, visual, tactile, and physical processing of language converge is in the use of song and sign in ESL students’ language development. In a review of related literature, only two studies that combined song with gestures or with sign language to achieve language gains were found (Buday, 1995; Madsen, 1991). Madsen (1991) paired gestures with and without

singing to assess new vocabulary acquisition in first graders. Children in the gestures-paired-with-music condition made significantly greater gains in learning and transference of new vocabulary words than did those in the gestures-only or the no-rehearsal conditions. In a similar study by Buday (1995), vocabulary words were actually paired with manual signs. Participants were children with autism who learned spoken and signed words in two formats: singing versus rhythmic speaking. The results revealed that the sung condition was significantly more effective than the rhythmic condition for sign and spoken word imitation.

These two studies offered promise for the use of singing paired with signing in language learning. It was in this vein that a holistic approach to language instruction for ESL children was investigated. The purpose of this study was to examine the effect of singing paired with signing on receptive vocabulary skills of elementary ESL students.

Method

A pilot study was conducted to probe the effectiveness of the research protocol and design for the main study. Fifteen early elementary, beginning level ESL students were selected to participate. They completed a pretest and posttest for 10 targeted vocabulary words which involved listening to a word spoken by the investigator and pointing to the corresponding picture from a set of six picture cards. The children were then randomly assigned to two groups, 7 in the control condition and 8 in the experimental condition.

Each group participated in four 15-minute sessions, during which they practiced the targeted vocabulary embedded in the lyrics to the song "My Favorite Things" from *The Sound of Music*. The control group rehearsed the text by repeating spoken lines in a rote manner and simultaneously imitating each sign paired with the target vocabulary. The experimental/music group rehearsed the text by repeating sung lines in a rote manner and simultaneously imitating each sign paired with the target vocabulary.

Results from the study indicated that both groups performed similarly on the pretest and on the posttest for receptive vocabulary skills. There were no significant differences between control and experimental group gain scores. All of the children showed significant improvement on the test after having participated in four language sessions which incorporated manual signs. In fact, 13 of the

15 participants scored 100% on the posttest. This ceiling effect may be attributed to providing sessions that were too comprehensive, as the spoken word was paired with the picture card at the start of each session and only one text was rehearsed. It might also be that the pretest and posttest for the 10 targeted vocabulary words was too simple in scope. Based on results of the pilot study, modifications for the main study included more targeted vocabulary words, more song texts, fewer sessions, and a pairing of the spoken word with its corresponding picture card only during the first session.

Participants

Participants were 80 students from three elementary schools in a large midwestern school district. The children targeted for this study were from the early grade levels, K-2, and were identified as belonging to either of the two most minimal classifications of English fluency: nonspeakers or limited English proficient (LEP). There were 42 females and 38 males. These students were of diverse nationalities and language backgrounds, the predominant native languages being Spanish, Hmong, and Lao.

Materials

The 20 targeted vocabulary words were selected on the basis of educational objectives already established in the schools. Teachers offered consultation and suggested thematic and categorical topics from which related words were targeted. One additional criterion for vocabulary selection was that the word have an American Sign Language (ASL) sign which is roughly equivalent in meaning and is somewhat iconic in visually depicting the word. During the course of the study, teachers were asked to not emphasize the selected words in the regular classroom to minimize the incidence of extraexperimental influence.

Manual signs from American Sign Language (ASL) represent units of communication in a visual-gestural language. These illustrations of spoken language were incorporated in two of the four intervention conditions to assess the potential of sign for facilitating ESL vocabulary acquisition. The investigator, a certified sign language interpreter, selected signs to be paired with the targeted vocabulary. Each vocabulary word is referred to as the "gloss," or approximate English equivalent, of the sign used.

A book of 20 sets of six picture cards was compiled. The pictures

were adapted from the *Peabody Picture Vocabulary Test—Revised* (PPVT-R) (Dunn & Dunn, 1981), which is a standardized, norm-referenced test of receptive vocabulary. The pictures, or “test plates,” employed in this specially designed measure are “simple, black-and-white illustrations” (p. x). In this revised edition, “all drawings are new or were reworked for better racial, ethnic, and sex balance” (p. 1). Further, the illustrations are constructed to have “approximately the same eye appeal (equal intensity and complexity of detail)” (p. 31). Individual pictures representing the 20 targeted vocabulary words were made into picture cards. For words not depicted in the PPVT-R, pictures with similar characteristics were made from computer clip art. To control for order effect, picture cards were randomized within sets and by presentation of sets. A 20 × 20 Latin square design (Winer, Brown, & Michels, 1991) was used to determine three orders of presentation. Children were posttested in the same set order given for their pretests.

Lyrics from three songs were used as the linguistic texts during the intervention sessions. The songs were “I’m Gonna Rise up Singing (Speaking),” “My Favorite Things,” and “Tie My Kangaroo Down.” The selection of song texts and melodies were determined by several factors. Initially, the decision was dependent upon the targeted vocabulary. Once these textual themes were chosen, existing and original songs were considered for use. Based on the justification of using children’s songs and songs from Broadway musicals for language development presented in the review of literature, songs reflecting those key characteristics were selected from these genres. Such characteristics include a simple melody, an appropriate vocal range, and repetitive lyrics. The lyrics from these songs served as the instructional texts for all of the participants, either as spoken or sung language.

Procedure

Initiation of the study involved consultation with teachers and principals at each of the three elementary schools. These discussions pertained to research objectives and protocol and to participation arrangements and scheduling. Potential participants were also identified. Then, parent or guardian approval was sought through informed consent letters. The letter was translated into the most common native languages. Only those children who returned signed consent forms were included in the study.

Once parental consent was secured, pretesting began. The format for both the pretest and posttest was identical. Testing occurred individually for approximately 10 minutes per child. Given the request "Point to the _____," the child selected a picture from a set of six picture cards. This was repeated for each vocabulary word for a total of 20 sets of pictures. Picture cards were arranged in a photo album of 20 pages with one set of six cards per page. The investigator recorded data by identifying responses for each of the words as either correct or by noting the incorrect word indicated.

Upon completion of the pretest, students were assigned to one of four treatment conditions matched by grade level, school, and gender. The treatment approach of each condition varied with respect to the mode through which language was presented and participation in learning was structured. The format of Condition 1 was sung text paired with signs, a combination of the two experimental variables. Children rehearsed the texts by singing lines along with the investigator and simultaneously imitating each sign paired with the targeted vocabulary. In Condition 2, spoken text was paired with signs. The students in this experimental condition had the use of signs as a single variable. They rehearsed the texts by reciting spoken lines with the investigator and simultaneously imitating each sign paired with the targeted vocabulary. Condition 3 used sung text only. Under this experimental condition, the use of music in the form of a cappella melodies was the variable. Participants rehearsed the texts by singing lines along with the investigator. Condition 4, the control, involved spoken text only. Under this condition, children rehearsed the texts by reciting spoken lines with the investigator. While there were only a total of four treatment conditions and 20 children were exposed to each, availability of students and space at the three schools warranted that actual interventions be carried out with numerous small groups.

All of the groups met for 15 minutes, three times across 1 to 2 weeks. During each session, they rehearsed the 20 targeted vocabulary words embedded in the selected texts. At the start of the first sessions the investigator said each targeted vocabulary word while showing the correct picture card, and the students imitated saying each word. Also during the first session, the texts were introduced, either spoken or sung in accordance with treatment condition assignment, in a rote call and response format. During the two ensuing sessions, children recited the full texts along with the investiga-

TABLE 1
Paired Sample t-tests by Treatment Condition

Variables by Condition	<i>M</i>	<i>SD</i>	<i>t</i> -value	<i>df</i>	2-tail sig*
Condition 1			8.98	19	.000
Pretest	11.30	4.73			
Posttest	17.95	3.91			
Condition 2			6.38	19	.000
Pretest	12.60	5.23			
Posttest	18.20	2.31			
Condition 3			4.86	19	.000
Pretest	10.50	4.05			
Posttest	14.15	4.51			
Condition 4			3.81	19	.001
Pretest	12.40	4.45			
Posttest	14.85	3.60			

* $p < .05$.

tor. After participating in the treatment sessions, each child individually completed the posttest.

Results

Pretest and posttest data were analyzed to compare differences within and among groups. Four separate *t*-tests for paired samples were conducted to determine differences between mean pretest and posttest scores of children in each condition. The data show that all groups of children demonstrated significant gains in receptive vocabulary identification (see Table 1).

To compare among groups, an analysis of variance (ANOVA) employing a $4 \times 3 \times 3 \times 2$ factorial design was conducted to determine whether differences existed among participants' pretest scores based on four independent variables. As shown in Table 2, there were no significant differences at the .05 level of significance among pretest scores by condition assignment or school. There were, however, initial differences in knowledge of the target vocabulary for grade level (second graders, $M = 13.79$, scored significantly higher than kindergartners, $M = 9.61$, and first graders, $M = 11.00$) and gender (males, $M = 13.31$, scored significantly higher than females, $M = 10.24$), as revealed by performing a Scheffé multiple range test on the ANOVA data. Consequently, pretest was used as covariate in the final factorial analysis.

TABLE 2
ANOVA of Pretests by Condition Assignment, Grade Level, School, and Gender

Source of Variation	SS	df	MS	F	p*
Main effects	481.39	8	60.14	3.54	.002
Condition assignment	6.17	3	2.06	0.12	.947
Grade level	106.91	2	53.46	3.14	.049
School	44.46	2	22.23	1.31	.277
Gender	206.52	1	206.52	12.14	.001
Explained	481.39	8	39.27	3.54	.002
Residual	1207.41	71	19.64		
Total	1688.80	79	21.38		

* $p < .05$.

Posttest scores were subjected to an ANCOVA using a $4 \times 3 \times 3 \times 2$ factorial design (see Table 3). This test revealed that there were no significant differences for grade level, school, or gender. There were, however, significant differences in posttest scores based on condition assignment, $F(3, 70) = 8.96$, $p < .000$. The data were further analyzed to determine what the differences were using a one-way ANOVA on gain scores—that is, pretest scores subtracted from posttest scores—and a Scheffé multiple range test.

The one-way ANOVA on gain scores by treatment conditions revealed significant differences among groups, as did the ANCOVA,

TABLE 3
ANCOVA of Posttests by Treatment Condition, Grade Level, School, and Gender with Pretest as Covariate

Source of Variation	SS	df	MS	F	p*
Covariate	286.52	1	286.52	40.89	.000
Pretest	286.52	1	286.52	40.89	.000
Main effects	263.46	8	32.93	4.65	.000
Treatment condition	190.28	3	63.43	8.96	.000
Grade level	30.51	2	15.25	2.16	.123
School	14.55	2	7.27	1.03	.363
Gender	2.16	1	2.16	0.31	.583
Explained	791.02	9	87.89	12.42	.000
Residual	495.37	70	7.08		
Total	1286.39	79	16.28		

* $p < .05$.

TABLE 4
Mean Gains in Vocabulary Scores for Treatment Conditions

Treatment Condition	Vocabulary Gain Score	
	<i>M</i>	<i>SD</i>
1 Sung text paired with signs	6.65	3.31
2 Spoken text paired with signs	5.60	3.93
3 Sung text	3.65	3.36
4 Spoken text only	2.45	2.87

$F(3, 76) = 6.23, p = .001$. The condition using both singing and signing had the highest mean (see Table 4). Because the condition that used spoken text paired with signs produced the second highest mean gain score, it seems the variable of using signs may have been more influential on learning vocabulary than was singing. Even so, the condition in which participants sang the text without using signs still produced a higher mean than did the spoken-text-only condition.

To determine comparative differences among the groups, a Scheffé multiple range test of the one-way ANOVA on gain scores by treatment condition was employed. Results, shown in Table 5, indicate that mean gain scores for treatment Conditions 1 (sung text paired with signs) and 2 (spoken text paired with signs) were both significantly higher than the mean gain score for Condition 4 (spoken text only), but not significantly different from Condition 3 (sung text) at the .05 level of significance. There were no significant differences between Conditions 3 (sung text) and 4 (spoken text only).

Discussion

The purpose of this study was to determine the effect of singing paired with signing on receptive vocabulary skills of elementary ESL students. Children participated in language sessions using one of four rehearsal conditions: sung text paired with signs, spoken text paired with signs, sung text, and spoken text only. Pretest and posttest data were analyzed to determine gains in receptive vocabulary identification and any differences among control and experimental groups. Results indicate that all four groups made signifi-

TABLE 5

Scheffé Multiple Range Test for Gain Scores by Treatment Conditions

Condition 1	Condition 2	Condition 3	Condition 4
6.65	5.60	<u>3.65</u>	2.45

Note. Underline means no significant differences among groups ($p < .05$).

cant pretest to posttest gains. The most effective conditions were those which incorporated the use of signs. Children in those two conditions made significantly greater gains in vocabulary recognition than those in the condition of spoken text only, though they did not score significantly higher than students in the sung text condition.

Results of the present study suggest the benefits of integrating signs into second language rehearsal in order to provide students with visual cues and to engage them in meaningful physical participation. These findings were consistent with previous research on the use of physical participation (Lessow-Hurley, 1996; Ramirez, 1995; Richards, 1975), visual reinforcement (Bechtold, 1983; Davis, 1994; Gray-Thompson, 1988; Yunus, 1981), and American Sign Language (Magrath, 1985; Quigley & Paul, 1984; Swisher, 1989) for heightened language development. The condition yielding the highest mean gain score was that in which signing was paired with singing, which suggests there are advantages to using a combination of the two for language acquisition. This finding is in agreement with studies conducted by Buday (1995) and Madsen (1991).

This study also indicates notable benefits can be gleaned from the use of singing paired with signing in second language development. This research demonstrated that children who actively engaged in singing or speaking new vocabulary words paired with signs performed significantly better than did children who rehearsed new vocabulary by speaking only. Therefore, an oral approach to second language instruction may be effectively supplemented by singing and signing. This is relevant to professionals who are devoted to advancing the quality of ESL programs by teaching, developing instructional strategies, designing curricula, and providing collaborative music therapy interventions. The findings of this study may offer useful information regarding a time-

effective and successful strategy to help students develop functional language skills.

These findings likewise affirm the potential of singing and signing to enhance the learning atmosphere. The playful approach employed in the instructional conditions seemed to provide a positive learning environment, which may account for the significant improvement on the targeted vocabulary within all four conditions. Text rehearsals emphasized language components in a structured format without drilling vocabulary in a labored fashion. Children were eager to attend sessions, were attentive to instruction, and demonstrated on-task behavior in following directions. Motivation seemed to be even more evident when children were allowed to learn through active participation with singing and signing, as opposed to when they were expected to receive cognitive input passively. This can be especially beneficial for younger children in the earlier stages of English learning. Although they may not initially comprehend the words used in an activity, singing and signing immediately engages them in language development.

In addition to the primary implications of study results, there are two secondary implications which pertain to nonlingual goals. Through the use of songs in language rehearsals, some music education objectives were addressed. Students learned children's songs, developed their singing voices, and participated in ensemble music-making. Participants also worked on motor skills as they were actively involved in both fine and gross motor tasks. The production of manual signs required dexterous use of fingers and exercised range of motion in arms. Therefore, the use of singing and signing for language development with ESL children may contribute to the development of additional skills. These inferences support the notion that the use of singing and signing creates a more holistic learning experience. American writer Ingrid Bengis once claimed "Words are a form of action, capable of influencing change. Their articulation represents a complete, lived experience" (as cited in *Passages Journal*, 1986).

The findings of this study generate several ideas for future research. While children who participated in language rehearsal using songs and signs improved on receptive identification of the targeted vocabulary words, building vocabulary is only one tenet of

language development. It would be interesting to see whether this knowledge generalizes to functional language usage. A study assessing the integration of the newly acquired vocabulary into the regular classroom could provide such insight. Along with investigating the generalization of vocabulary usage, more needs to be known about using songs and signs for development of other language-mastery skills, such as speaking, reading, and writing. Based on the subjective observations made during this study, there specifically should be further investigation into the effectiveness of singing and signing on expressive language development. Finally, techniques for broader application of music and sign language in ESL acquisition should be explored also to extend to students of all ages and to those with more advanced levels of English fluency.

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