The Influence of Mayan Education on Middle School Students in Guatemala

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The purpose of this study was to examine the influence of Mayan education on the academic achievement of Indian and Ladino middle school students (N = 353) in Guatemala. This study also examined changes in ethnic identity achievement and the effects of changes in ethnic identity achievement on gains in self-esteem and other-group attitudes. Superior gains in academic skills for both Ladino and Indian students attending Mayan schools were found. The results also suggested that those students who increased their ethnic identity scores during their first year of middle school also increased their other-group attitudes. These results are discussed in terms of the benefits of Mayan education and ethnic identity achievement for both Indian and Ladino students.

Keywords: Mayan education, ethnic identity, middle school, Kiche', Q'eqchi'

Guatemala today has a population that is divided between various Indian (40%) and non-Indian groups (Beckett & Pebley, 2002; Central Intelligence Agency, 2005). Most of the Indian groups are considered to be descendents of the ancient Maya civilization (Fischer & Brown, 1996) that dominated the area that is now Guatemala during the first millennium AD. The domination of Spaniards over Indians began with the Spanish invasion in 1523 (Smith, 1990) and lasted for almost three centuries, during which Indians were pressured to assimilate into the Spanish colonial culture in order to serve the needs of the Spanish Empire. Even after Guatemala became a sovereign state, indepen-
dent of Spain, in 1821, Indians were still encouraged to drop their indigenous identities and languages to become “Ladino” (Richards & Richards, 1996). Currently, most of the non-Indian people of Guatemala are called Ladinos, a mix of the descendents of the ancient Mayas and Spanish colonists, who are regarded as part of the dominant national culture (Nyrop, 1984; Smith, 1990; Warren, 1989). The process of shifting from Indian to Ladino has been called “ladinization,” which involves the acquisition of Spanish language skills and moving away from the home village in pursuit of employment and a better life elsewhere in Guatemala (Nyrop, 1984; Warren, 1989). Historically, when Indians become Ladinos, they rarely return to their Indian identities (Nyrop, 1984; Warren, 1989). At present, Ladinos range widely in terms of their wealth, but still, on average, have higher social status than Indians (Beckett & Pebly, 2002; Nyrop, 1984).

In terms of education during the colonial period, the Spanish worked vigorously to eliminate the use of indigenous languages and identities in order to convert the Indians to Spanish-speaking Christians (Heath & La Prade, 1982). This approach to education was continued when Guatemala became an independent nation (Richards & Richards, 1996). Indeed, Ladinos were created as an ethnic group by centuries of educational efforts to promote the use of Spanish and national identities over the use of Indian languages and Indian identities. By the early 20th century, however, there were still some Indian groups that had largely avoided ladinization because the Guatemalan government had not provided schooling. In 1965, Guatemala rewrote its constitution, which included articles requiring that all Indian groups be educated to promote the national interest (Richards & Richards, 1996). The new laws allowed introductory education to be delivered in the local indigenous language in order to encourage Indian children to attend school. This use of the indigenous language, however, was regarded as transitional to learning Spanish as the ultimate goal (Richards & Richards, 1996).

The present study took advantage of differences in the schools serving two large and distinct Indian communities. The enrollment of the middle schools sampled for this study served Ladinos and students from Indian communities that speak one of two common Indian languages, Kiché or Q’eqchi’. Further, the enrollment of these middle schools was fairly evenly divided between one of the Indian groups and Ladinos.

In general, the Indians who speak Kiché have higher levels of educational attainment and earnings than other Indian groups in Guatemala (Patrinos, 1997). Because of the relative educational and economic success of the Kiché, the middle schools serving them provide a curriculum with little content relevant to the Kiché language or culture. In contrast, the Indian students whose native language is Q’eqchi’ live in one of the 22 administrative units of Guatemala, the department of Alta Verapaz, that continues to have a distinctive and strong native culture (Shackt, 2000). The Q’eqchi’ language is commonly spoken in Alta Verapaz, and even Ladinos speak a little of it, when necessary, in addition to their native Spanish (Fischer & Brown, 1996). However, the Q’eqchi’ people, as a group, have less formal education and lower earnings than do other Indian groups, particularly the Kiché (Patrinos, 1997). In an effort to draw more Q’eqchi’ into the formal education process, the primary schools have offered bilingual education (World Bank, 1995), informed largely by the Mayan education movement. This movement created many primary and secondary schools, called Escuelas Mayas, that maintained Q’eqchi’ language and cultural content within the curriculum, including the middle school curriculum (Richards & Richards, 1996).

Academic Skills

Cummins (1986); LaFromboise, Coleman, and Berton (1993); Van Hamme (1996); and others have argued that giving students...
the skills they need to be successful in the two cultures they live in promotes their educational success. The general notion is that acquiring skills in the second culture provides the student with a sense of mastery and efficacy that promotes learning in general (Hughes & Chen, 1999; LaFromboise et al., 1993; LaFromboise, Oliver, & Hoyt, 2004). Based on this research, we expect to find that students enrolled in Mayan schools gain more academic skills than students enrolled in non-Mayan middle schools. Another goal of this study is to examine whether the academic benefits of attending Mayan schools apply to Ladino as well as Indian students.

**Ethnic Identity Development**

The process of ethnic identity development has been theorized to begin in early adolescence (Phinney, 1989, 1990), around the time when an individual's overall identity begins to form (Eriksen, 1968). According to theories proposed by authors such as Tajfel (1981), and Tajfel and Turner (1986), if adolescents live in an ethnically mixed environment, they have the opportunity to develop strong ethnic identities. With positive support for learning about their own ethnic group, adolescents can achieve a secure and confident sense of their ethnic identity (Phinney, 1990; Van Hamme, 1996). Research has demonstrated that ethnic identity among youth is positively related to self-esteem (Roberts, Phinney, Masse, Chen, Roberts, & Romero, 1999; Phinney, 1989; Phinney & Alipuria, 1996) as well as positive attitudes toward members of other ethnic groups (Phinney, Ferguson, & Tate, 1997). The development of a strong ethnic identity, however, usually takes years (Phinney, 1990; Phinney & Chavira, 1995).

It seems likely that children who grow up in an area with a strong and active Indian culture would have more opportunity to think about differences between ethnic groups and achieve a greater personal sense of ethnic identity than are children who grow up in an area with a less distinct Indian culture. Thus, in the context of this study, it is expected that students who live in Alta Verapaz will have achieved higher levels of ethnic identity than students who live in the other departments. However, this difference may be moderated by ethnic group. Perhaps, the ethnic identity achievement of Indian, but not Ladino students would be affected by these differences in ethnic environments.

Currently, in Guatemala, public school students generally attend primary schools near their homes; consequently, their classmates tend to come from their own Indian or Ladino group. When students begin secondary school, however, they are forced to attend schools farther away from home and interact with students from other groups. The present study took advantage of this structural transition to examine if and how students change during their first year in secondary school, when they become classmates of students from other ethnic groups. In particular, the impact of the first year of middle school on the ethnic identity achievement of Indian and Ladino students is examined by this study. One might hypothesize that the first year of middle school, particularly in the context of classmates from other ethnic groups, might promote ethnic identity achievement. On the other hand, contact with these other ethnic groups within the same classrooms might be distracting and lead to a loss of ethnic identity achievement.

Furthermore, one might wonder whether these changes in ethnic identity achievement would be associated with other changes, such as changes in self-esteem or attitudes toward people from other ethnic groups. A concern about strong ethnic identities has been that they can serve as the basis of conflict between ethnic groups (Levinson, 1950; Mason & Verkuyten, 1993; Tajfel & Turner, 1979). This is a particular concern for Guatemala because, between 1978 and 1984, there was significant violence between the military and guerrilla groups attempting to overthrow the government. Many thousands
of Indian people living in rural areas were killed because the military perceived them to be sympathetic to the rebels (Fischer & Brown, 1996). The present study examines whether an increase in ethnic identity achievement is associated with gains in self-esteem as well as an increase in positive attitudes toward members of other groups.

Method

Sampling Procedure

In order to sample students who were identified as speaking Q’eqchi’ or Kiche, secondary schools were selected from three departments, where the Q’eqchi’ or Kiche people predominated. Middle schools were randomly selected within these three departments from a database that the Guatemalan Ministry of Education provided. Permission to conduct the study was requested from the principal of each selected school, and if the principal did not agree, then another school from the database was randomly selected and approval sought. With the approval of the principal, Kiche’ or Q’eqchi first-year students and their Ladino peers were selected from the school’s roster and invited to participate. If the student did not agree, then another student was randomly selected and invited to participate. This recruitment of students was continued until a sample size of at least 80 Q’eqchi’, 80 Kiche’, and 160 of their Ladino peers was obtained.

Participants

At the first wave of data collection, five schools in Alta Verapaz contributed 182 students, three schools in Quetzaltenango contributed 122 students, and two schools in Quiche’ contributed 69 students. Table 1 presents the distribution of students over the three departments, ten schools, and two ethnic groups. Q’eqchi’ students resided in Alta Verapaz and the Kiche’ students resided in the other two departments. The sample at the first wave consisted of 373 students (49% Ladino). Twenty students were not present in the schools when the second wave of data collection occurred, leaving us with a sample of 353 students (48% Ladino). This loss to attrition was not concentrated in any one ethnic group or department.

About equal numbers of boys and girls were sampled from each of the 10 schools;

| Table 1 Distribution of Students by Department and Ethnic Group at Both Waves |
|-----------------|-------------------|-------------------|-------------------|-------------------|
| Department      | School | Ladino | Indian | Ladino | Indian |
| Alta Verapaz    | 1      | 16     | 14     | 15     | 14     |
|                 | 2      | 29     | 33     | 26     | 33     |
|                 | 3      | 15     | 15     | 15     | 15     |
|                 | 4      | 15     | 15     | 15     | 15     |
|                 | 5      | 19     | 11     | 14     | 10     |
|                 | Total  | 94     | 88     | 85     | 87     |
| Quetzaltenango  | 6      | 33     | 29     | 32     | 27     |
|                 | 7      | 14     | 16     | 12     | 14     |
|                 | 8      | 15     | 15     | 14     | 14     |
|                 | Total  | 62     | 60     | 60     | 55     |
| Quiche’         | 9      | 16     | 23     | 15     | 22     |
|                 | 10     | 11     | 19     | 11     | 18     |
|                 | Total  | 27     | 42     | 26     | 40     |

Note. The sample size for the first wave was 373. For the second wave, the sample size was 353.
overall, 52% of the sample was male. The mean age of the students was 13.77 (SD = 1.44), ranging from 11 to 18 years at the first wave. All the students in the sample came from families of the upper levels of the lower classes. In Guatemala, the poorest families cannot afford to send their children to secondary school, and the middle and upper classes usually send their children to private schools.

**Instruments**

Academic achievement, in terms of reading comprehension and mathematics skills, was assessed with standardized tests (Baessa, Girón, Mejía, de Cordon, de Avendano, & Fernández, 1999). These achievement tests were developed as part of a program, undertaken by the Ministry of Education of Guatemala and financed in part by a loan from the World Bank. Because there is no standard curriculum in Guatemala, the tests that were developed were norm-referenced. To enhance test validity, however, several strategies were employed, including interviews with teachers, observations of teaching in classrooms, and a review of all the textbooks used in the target grades. In the case of the reading comprehension tests, a list was made of all the words appearing in the textbooks and the items were elaborated using these words. The tests were developed for third and sixth grades (both grades in elementary), and ninth grade (known in Guatemala as third grade in secondary). In the reading test, there were two sections, vocabulary and reading comprehension; and in the mathematics test there were three sections: arithmetic operations, arithmetic concepts, and word problems.

The draft reading and mathematics tests were piloted, and the results were analyzed several times until satisfactory psychometric properties were found. Each test had two parallel forms to minimize the risk of cheating during the applications. A total of 9717 students were tested during 1999, both in public and private school, as well as urban and rural areas. As a result of these preliminary data collections, the estimated reliability of the tests (using Cronbach Alpha) ranged from 0.80 to 0.88.

For this project, the achievement tests designed for sixth grade were used because the students were just entering their first year of secondary school, during which teachers usually review and elaborate on what students learned during their last year of primary school, which in Guatemala is the sixth grade. The scores are represented here as percent correct of the total score for the reading and mathematics tests.

The Multiethnic Identity Measure (Phinney, 1992) was the basis of two scores used here to measure ethnic identity achievement and attitudes toward interacting with members of other ethnic groups. This instrument was translated into Spanish and adapted to the Guatemalan middle school context (Baessa, Falbo, & Fernández, 2001) using the “adapt and apply” procedure (Van de Vijver & Leung, 1997). Three bilingual students from Guatemala back-translated the Spanish version into English. Compared to the original ethnic identity achievement scale (Phinney, 1992), this adapted scale added two items, which were extensions of one of the original items. The additional items specified the “others” whom the students used as resources for learning more about their group, specifically, elders and teachers. Compared to the original other-group attitudes scale (Phinney, 1992), the adapted scale was augmented by six items. These new items elaborated on one of the original items, which had used the term, “mixing,” a colloquial expression in English that was not clearly translated into Spanish by a single item. The additional items specified the context of this mixing. The revised instruments used 5-point response formats, and the ethnic identity and other-group scores are represented here as the sum of the ratings across all the items of each scale.

To measure self-esteem, the total score from a revised and adapted version of the Coopersmith Self-Esteem Inventory (Coopersmith, 1967; García, 1998) was used. Like
the original scale, this revised version had 58 items to which students responded in terms of, “Like Me” or “Unlike Me,” and the original scoring procedure was used to generate the total score.

Procedure for Data Collection

The school year in Guatemala normally starts in January, but because of a teachers’ strike, school and student recruitment was delayed until March 2003, after the strike was resolved. Consequently, the first wave of data collection occurred in the schools during late April, and the second wave was collected in late August, near the end of the school year.

The achievement tests were administered to groups of students who were assembled in unused classrooms during regular school hours. Students were given one hour to complete their reading test and one hour for their mathematics test. One form of the achievement test was used at the beginning and another form of the same test was used at the end of the school year. The students answered the achievement test questions on their own, using electronic answer sheets.

In contrast, the other instruments were administered to students individually, with each statement and possible response read to them by a research assistant in Spanish. This procedure was selected because previous experience with data collection from this age group (Baessa et al., 2001) showed that when middle school students were asked to use a rating scale, they had difficulty distinguishing between intermediate and end points. Even though the personal attention of an adult interviewer increased the likelihood that the students considered each item seriously and used the rating scale properly, we acknowledge that the presence of the adult interviewer may have discouraged students from making socially undesirable, yet truthful responses. For all but the achievement tests, the same instruments were used during the first and second wave of data collection.

Observations Within Schools

Three times near the beginning and three times near the end of the school year, ethnographic fieldwork was conducted by research assistants who went to each of the 10 schools to make observations of the first-year students in their classrooms and during free time on school grounds. In addition to making notes about what courses were being taught and what instructional methods were being used, the observers were looking for interethnic interactions, either between teacher and student or between students.

The field notes indicated that the 10 schools were highly differentiated in terms of degree of student discipline and structure. In general, because the schools serving these students lacked textbooks, instruction involved the teachers dictating the course material and the students taking notes or copying from the teacher’s notes. The observers reported that all instruction was in Spanish, and Spanish was the most common language spoken between students during class time. However, Indian students were observed speaking their native languages outside of the classroom.

The field notes also indicated that the middle schools serving Q’eqchi’ students required a course in the Q’eqchi’ language for all students, Indian and Ladino, while no Indian language course was offered in the schools serving the Kiche´ students. The Q’eqchi’ course was an additional core course, taught in Spanish, as were all the other core courses, specifically, Spanish, mathematics, social studies, and natural science. In Mayan and non-Mayan schools, students also had the opportunity to take various other courses, such as music, physical education, industrial arts, and textiles. The main curricular difference between middle schools serving Q’eqchi’ students and those serving Kiche´ students was that schools serving Q’eqchi’ students required all students to take a course in the Q’eqchi’ language, while the schools serving Kiche´ students did not even offer an elective course in the Kiche´ language.
We observed many interethnic interactions between students and between teachers and students and they were generally positive; no negative interethnic interactions were observed. However, students tended to affiliate within their gender and ethnic groups during their free time. Furthermore, the observers noted that Ladino boys often appeared dominant, while Indian girls were often quiet and withdrawn in the classrooms and schoolyards.

Data Analysis

The main independent variables were selected based on our initial interest in comparing Q’eqchi’, Kiche’, and Ladino students as they enter middle school and on our observational data suggesting importance of school, school type, and gender differences. There were five main independent variables in the analyses used to test our hypotheses, the first four represent between-subjects variables. First, Ethnic Group: Indian Students, coded (1), Ladino Students, coded (0). Second, Mayan schools: Enrollment in a Mayan School, coded (1), or in a non-Mayan School, coded (0). There were five Mayan schools, all of which were within the same department and five non-Mayan schools, which were in two different departments. We compared the scores to determine if the students who went to school in Quetzaltenango differed from the students who went to school in Quiché. We found no significant differences between the students from these two departments on both waves of data collection, thereby justifying combining the subjects from these two departments into the non-Mayan school category. Third, Schools: The independent variable representing the 10 individual schools was nested within the Mayan Schools variable. Fourth, Gender: Boys, coded (0), Girls, coded (1). Gender was added to consider possible gender main effects and interactions with other independent variables, such as Ethnic Group. Fifth, Within-subjects: This variable represents the change between the first and second waves. The two and three-way interactions of this Within-subjects variable with the between-subjects variables of Mayan Schools, Ethnic Group, and Gender were also included in these analyses.

In the first set of analyses performed, we conducted two analyses of variance to determine the effects of the five independent variables on gains in academic skills. Then, we conducted an analysis of variance to examine the effects of the five independent variables on changes in ethnic identity achievement. In the third set of analyses, we conducted two analyses of variance to examine the effects of the independent variables on changes in self-esteem or other-group attitudes. In these analyses, there was an additional between-subjects variable, representing whether the students’ ethnic identity achievement score increased, stayed the same, or declined from the beginning to the end of the school year.

Results

Preliminary Analysis

Preliminary analyses were conducted in order to evaluate the reliability and validity of the instruments used in this study. Table 2 presents the ranges, means, standard deviations, and alpha coefficients of the scale scores generated from both waves of data collection. For all five types of dependent variables, the scores at the first wave were positively and significantly correlated with scores at the second wave. Specifically, the correlation for reading was $r(351) = .76, p < .0001$, for mathematics, $r(351) = .61, p < .0001$, for ethnic identity achievement, $r(351) = .47, p < .0001$, for self-esteem, $r(351) = .55, p < .0001$, and for other-group attitudes, $r(351) = .48, p < .0001$.

The item-total correlations for the modified scales, ethnic identity achievement and other-group attitudes, were also calculated. All item-total correlations were positive and significant, averaging .52 for ethnic identity.
achievement and .59 for other-group attitudes.

In order to evaluate the validity of the scale scores used in this analysis, several correlations were conducted. Based on previous research (Cascallar & Dorans, 2003), the correlations between the reading and mathematics scores were expected to be positive and significant, and this was found at the first assessment, \( r(371) = .48, p < .0001 \), and the second assessment, \( r(351) = .51, p < .0001 \). A positive association between self-esteem and academic skills was expected because academic competence can serve as a basis of enhanced self-worth (Coopersmith, 1967; Shaalvik & Hagtvet, 1990). Consistent with this expectation, significant and positive associations between reading and self-esteem scores, \( r(371) = .25, p < .001 \), and between mathematics and self-esteem scores, \( r(371) = .19, p = .0002 \), were found at the first assessment. Likewise, significant correlations between self-esteem and reading scores, \( r(351) = .18, p = .0006 \), and self-esteem and mathematics scores, \( r(351) = .13, p = .0146 \), were also found at the second assessment. Since the achievement of ethnic identity is posited to be a developmental task accomplished during adolescence, a positive association between age and the ethnic identity scores was expected. This positive and significant association was found at the first assessment, \( r(371) = .17, p = .0008 \), and the second assessment, \( r(351) = .11, p = .0359 \), which is consistent with previous results (Phinney & Chavira, 1995). Similarly, consistent with previous findings with secondary students (Phinney, 1992), the degree of ethnic identity achievement was expected to have a small but significant correlation with other-group attitudes, and this is what was found at the first assessment, \( r(371) = .10, p = .0507 \), and second assessment, \( r(351) = .11, p = .0472 \).

### Hypothesis Testing

**Mayan Schools & Academic Skills.** In order to determine if attending a Mayan school would affect the degree of gains in academic skills during the first year of middle school, two analyses of variance were conducted. In terms of reading skills, the results yielded a significant interaction between the Within-subjects and Mayan Schools variables, \( F(1, 335) = 8.41, p = \).
.0040. Likewise, in terms of mathematics skills, the results indicated a significant interaction between the Within-subjects and Mayan Schools variables, $F(1, 335) = 6.49, p = .0113$. The means for these effects are in Table 3 and indicate that students attending a Mayan school gained more than did students who did not.

These analyses also indicated that Ethnic Group did not moderate this Mayan Schools effect. In terms of reading skills, the interaction of the Within-subjects, Ethnic Group and Mayan Schools variables was not significant, $F(1, 335) = 0.01, p = .9209$. Similarly, for mathematics, the interaction of the Within-subjects, Ethnic Group, and Mayan Schools variables was not significant, $F(1, 335) = 0.50, p = .4815$.

These analyses also indicated that there was a significant Within-subjects main effect for reading, $F(1, 335) = 18.40, p < .0001$ but not mathematics, $F(1, 335) = 1.63, p = .2021$. This means that students improved in their reading, but not mathematics skills.

**Influences of Mayan Education**

**Changes in Ethnic Identity Achievement.** Given that there was no overall gain in ethnic identity achievement, and the interaction between the Within-subjects, Mayan Schools, and Ethnic Group variables was complex, further examination of the changes in ethnic identity achievement at the individual level was warranted. To examine how ethnic identity achievement changed for individual students during the course of the first year of middle school, the scores from the second wave were subtracted from the scores from the first wave. These difference scores ranged from $-16$

<table>
<thead>
<tr>
<th>Scale</th>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 1</th>
<th>Wave 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mayan schools</td>
<td>Non-Mayan schools</td>
<td>Mayan schools</td>
<td>Non-Mayan schools</td>
</tr>
<tr>
<td>Reading</td>
<td>49.47 (18.28)</td>
<td>59.35 (18.02)</td>
<td>54.70 (18.74)</td>
<td>60.67 (16.88)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>62.61 (15.49)</td>
<td>63.18 (18.02)</td>
<td>66.27 (15.43)</td>
<td>65.30 (19.71)</td>
</tr>
</tbody>
</table>

*Note.* Standard deviations of means are in parentheses.
to 25, indicating wide variation over the course of the first year of middle school. About 46% of the students declined in ethnic identity achievement, about 8% remained precisely the same, and the rest gained. In order to determine if this change varied as a function of the students’ gender, ethnic group, or Mayan school, chi-square analyses were conducted examining the degree of association between the direction of change (loss, same, gain) and each of these variables. None of the Cochran-Mantel-Haenszel statistics indicated as significant association. Consequently, a variable reflecting direction of ethnic identity change was added to the other independent variables in analyses of variance of self-esteem and other-group attitudes scores.

Identity Change and Self-Esteem. A between-subjects variable representing the direction of change in ethnic identity achievement (loss, same, gain), called Identity Change, was added to the other independent variables and an analysis of variance was conducted on self-esteem scores. The results of this analysis indicated that the Within-subjects main effect was significant, $F(1, 326) = 7.94, p = .0050$, with students scoring higher ($M = 60.11$) at the second wave than the first ($M = 58.06$). The interaction between this Within-subjects variable and the Identity Change variable was not significant, $F(2, 326) = 2.48, p = .0985$, although there was a trend. The means are presented in Table 5 and indicate that students whose ethnic identity achievement declined over the course of the school year did not gain much in self-esteem. However, students whose ethnic identity achievement gained or stayed the same over the school year experienced increases in their self-esteem. None of the other independent variables interacted significantly with the Within-subjects variable.

Identity Change and Other-Group Attitudes. In order to determine if Identity Change affected other-group attitudes, an analysis of variance was conducted. The results

<table>
<thead>
<tr>
<th>Schools</th>
<th>Wave 1</th>
<th>Wave 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ladino</td>
<td>Indian</td>
</tr>
<tr>
<td>Mayan</td>
<td>28.89 (5.99)</td>
<td>30.43 (6.38)</td>
</tr>
<tr>
<td>Non-Mayan</td>
<td>27.93 (5.87)</td>
<td>26.58 (6.32)</td>
</tr>
</tbody>
</table>

Note. Standard deviations of means are in parentheses.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Identity change</th>
<th>Wave 1</th>
<th>Wave 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem</td>
<td>Loss</td>
<td>59.02 (11.07)</td>
<td>59.65 (13.08)</td>
</tr>
<tr>
<td></td>
<td>Same</td>
<td>62.07 (8.35 )</td>
<td>66.30 (10.45)</td>
</tr>
<tr>
<td></td>
<td>Gain</td>
<td>56.41 (12.02)</td>
<td>59.55 (13.08)</td>
</tr>
<tr>
<td>Other-group</td>
<td>Loss</td>
<td>47.93 (9.16 )</td>
<td>46.55 (9.72 )</td>
</tr>
<tr>
<td>attitudes</td>
<td>Same</td>
<td>45.15 (7.64 )</td>
<td>47.30 (10.89)</td>
</tr>
<tr>
<td></td>
<td>Gain</td>
<td>45.71 (9.64 )</td>
<td>47.95 (8.98 )</td>
</tr>
</tbody>
</table>

Note. Standard deviations of means are in parentheses. For Loss group, $n = 163$; for Same group, $n = 27$; for Gain group, $n = 160$. 

TABLE 4 Means of Ethnic Identity Achievement for Interaction of Mayan Schools and Ethnic Group Variables with the Within-Subjects Variable

TABLE 5 Means of Self-Esteem and Other-Group Attitudes for the Interaction between the Identity Change and Within-Subjects Variables
indicated that the main effect of the Within-subjects variable was not significant, $F(1, 326) = 0.16, p = .6852$. However, the Within-subjects variable interacted significantly with Identity Change, $F(2, 326) = 4.20, p = .0159$. The means are presented in Table 5 and indicate that students with declining ethnic identity achievement had other-group attitudes that also declined. Conversely, students whose ethnic identity achievement increased or stayed the same had other-group attitudes that increased.

**Additional Findings**

**Schools.** There was wide ranging variation associated with the 10 individual schools, in terms of gains in the academic skills, ethnic identity achievement, and other group attitudes. The Within-subjects variable interacted significantly with Schools in terms of reading skills, $F(8, 335) = 2.45, p = .0139$, math skills, $F(8, 335) = 3.10, p = .0022$, ethnic identity achievement, $F(8, 335) = 6.11, p < .0001$, and other-group attitudes, $F(8, 335) = 4.19, p < .0001$, but not self-esteem, $F(8, 335) = 0.52, p = .8428$.

**Gender.** Significant main effects for Gender were found in mathematics. Boys ($M_{wave1} = 65.19; M_{wave2} = 66.46$) outscored girls ($M_{wave1} = 61.17; M_{wave2} = 62.80$) at both the first, $F(1, 350) = 4.79, p = .0292$, and second assessment, $F(1, 350) = 3.86, p = .0504$. Otherwise, no significant interactions between Gender and the Within-subjects variable, or between Gender and the other between-subjects variables were found.

**Discussion**

One of the goals of this study was to examine the influence of attending Mayan middle schools on the acquisition of academic skills in Guatemala. The results indicated that significantly greater gains in reading and mathematics skills were found for students enrolled in Mayan schools, compared to students enrolled in non-Mayan schools. Note that the students’ ethnic group did not moderate this benefit. Similar benefits were found for Ladino and Indian students.

Note also that the enhanced gains in academic skills for students in Mayan schools were not limited to reading skills alone. If the academic skills benefit had been limited to reading skills, then this finding might have been explained by the extra Spanish instruction offered by a Mayan language course, taught in Spanish. However, the finding that the academic benefits extended to mathematics skills as well suggests that something more fundamental was going on in Mayan schools that promoted learning in general. Such benefits had been expected, based on models of bicultural competence (Hughes & Chen, 1999; LaFromboise et al., 1993; LaFromboise et al., 2004). Specifically, these models argue that providing students with the skills they need to be competent in the two cultures in which they live promotes a sense of mastery, thereby enhancing their acquisition of academic skills.

Another goal of this study was to examine the influence of Mayan schools on ethnic identity achievement. Our results indicated that the changes in ethnic identity achievement during the first year of middle school were complex and moderated by ethnic group. Although Indian students attending Mayan schools scored the highest in their ethnic identity achievement at the beginning of the school year, they did not increase, but remained high in their ethnic identity achievement. Instead, it was the Ladino students in Mayan schools that increased their ethnic identity achievement to catch up with their Indian classmates during the school year. In contrast, the Ladino students attending the non-Mayan schools stayed the same in their ethnic identity achievement, but their Indian peers increased. In general, it appears that within each type of school, the ethnic group with the lower ethnic identity achievement in-
creased in their ethnic identity achievement during the course of the school year to more closely resemble the ethnic identity achievement of the other group.

Although one might have expected that the experience of interacting with students of the other ethnic group within the same classrooms would promote ethnic identity achievement, no general gain in ethnic identity achievement was found. Instead, about equal percentages of students declined as increased in their ethnic identity achievement over the course of their first year in middle school. The results indicated that this degree of change over the course of the school year was related to changes in the student’s other-group attitudes. Students who declined in their ethnic identity achievement became significantly less positive about interacting with people from other ethnic groups. Conversely, students who increased or stayed the same in terms of their ethnic identity achievement became more positive about interacting with people from other ethnic groups. These results overall suggest educators should not fear increases in ethnic identity achievement among their Indian and non-Indian students. Instead, gains in ethnic identity achievement were associated with increases in positive attitudes toward interacting with members of other ethnic groups.

We found only one significant gender difference in all the outcomes we considered in this study. Boys scored higher than girls in math at both times of assessment. The gender variable did not interact significantly with any of the other between-subjects variables, nor did gender interact significantly with the within-subjects variable. Thus, our classroom observations of dominant Ladino boys and submissive Indian girls were not reflected in the outcomes assessed with our analyses.

One of the major sources of variance within the outcomes of the middle school students was the variation within schools, across time. The field notes provide only suggestive information about this wide variation. Some of the schools in our sample were well established with focused teachers and disciplined students. Other schools were relatively new and had yet to establish a structured learning environment or student discipline. The most obvious distinction within the 10 middle schools in our sample was between those schools requiring a Mayan language course of all students and the schools not offering a single course with Mayan content. However, the students in the Mayan schools probably had benefited from years of Mayan education and consequently, we cannot conclude that the Mayan language course alone brought about the differences noted in this study. We acknowledge that many student, family, and community characteristics could also have contributed to our findings.

References


Shackt, J. (2000). La Cultura Q’eqchi’ y el asunto de la identidad entre indígenas y ladinos en Alta Verapaz [The Q’eqchi’ culture and the issue of identity between Indians and Cadinos...
Correction to Fernandez, Malacme, Wilfley, and McQuaid (2006)

In the article “Factor Structure of the Bulimia Test-Revised in College Women from Four Ethnic Groups” by Senaida Fernandez, Vanessa L. Malacme, Denise E. Wilfley, and John McQuaid (Cultural Diversity & Ethnic Minority Psychology, 2006, Vol. 12, No. 3, pp. 403–419), the coauthor’s name should be spelled as follows:

Vanessa L. Malcarne