Cultures of teaching in childhood: Formal schooling and Maya sibling teaching at home

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Abstract

Culture can be thought of a set of shared practices, beliefs, and values that are transmitted across generations through language [Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press]. Teaching is one way that culture is transmitted, but forms of teaching vary across cultures and across activity settings within cultures. This article explores the impact of culture on styles of teaching in a place where more than one cultural model of teaching is found: the Zinacantec Maya of Chiapas, Mexico. Zinacantecos have an indigenous model of teaching that applies to the learning of informal tasks, such as making tortillas and weaving. When children go to school, the indigenous model interacts with the model found at school, and this mixed model is transferred back home to sibling interactions. Videotaped ethnographic observations and quantitative discourse analyses reveal cultural patterns in the development of children’s teaching.

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Teaching is a mode of cultural transmission that varies across cultures (Stevenson & Stigler, 1992; Stigler & Hiebert, 1999) and activity settings (Cole & Cole, 2001; Greenfield, 1984), and that develops in childhood (Maynard, 2002; Strauss, Ziv, & Stein, 2002; Wood, Wood, Ainsworth, & O’Malley, 1995). Learning how to teach occurs in activity settings that are situated in cultural places. There is variation in the activity settings of teaching across cultures, and sometimes across practices within the same culture. For example, children participating in an apprenticeship with a master teacher are exposed to a different kind of teaching than children participating in formal schooling (Cole & Cole, 2001).

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Children may be accustomed to one model of informal teaching at home and learn about a different model of teaching when they go to school. This may be especially true for immigrant children or for children living in a place where school culture is not closely related to their home culture. This mismatch can make school a cross-cultural experience for those children. Understanding this cultural mismatch may help explain some of the difficulties immigrant children have in adapting to school, where the culture of the school is often different from the culture found at home (Gallimore & Goldenberg, 1993; Trumbull, Greenfield, Rothstein-Fisch, & Maynard, in press; Trumbull, Greenfield, Rothstein-Fisch, & Quiroz, 2001). There is also a more general lesson about the ways that children adapt to new experiences, such as at school, and integrate them into their everyday practices at home.

The intention of this article is to examine children’s teaching in the context of the activity setting of teaching at home and the ways that exposure to a school model of teaching influences children’s teaching style back at home. Cross-cultural data, from indigenous Zinacantec Maya children of Chiapas, Mexico, are used to investigate the transfer of the school model to home practices. “Cross-cultural” is taken to have two meanings. First, the data come from a culture outside Western countries where practices and modes of behavior are quite different. Second, Zinacantec children face a cross-cultural divide when they go to school. That is, schooling for Zinacantec children is a cross-cultural experience: the schoolteachers are Spanish-speaking and of Mexican descent (locally called Ladino). This is in contrast to the Zinacantec children, who speak Tzotzil and are descended from Maya people.

This article will examine the activity setting of everyday teaching, in the context of the indigenous Zinacantec model of teaching and learning, and compare it with the activity setting of formal education in school. Zinacantec children who are in school are a source of information for other children who are not in school. Zinacantec children who go to school are also a source of a style of teaching from the unfamiliar, school culture, which they transfer to interactions with unschooled children at home. The teaching behaviors of children who have been to school will be compared with the teaching behaviors of children who have not.

1. Children as guides in each other’s development

There is ample evidence in the literature that children are effective as guides or teachers in each other’s social and cognitive development. Children are effective at helping each other to perform cultural tasks and to participate in cultural activities within their own peer cultures (Ashley & Tomasello, 1998; Brownell & Carriger, 1991; Corsaro, 1985; Goodwin, 1990; Haight & Miller, 1993; Rogoff, 1990; Strauss et al., 2002; Tobin, Wu, & Davidson, 1989; Wood et al., 1995). Siblings may be especially effective at socializing each other, in guiding each other in cultural tasks, or in giving verbal or nonverbal didactic help (De Leon, 2002; Dunn, 1989; Maynard, 2002; Rabain-Jamin, Maynard, & Greenfield, 2003; Rogoff, Mistry, Gönçü, & Mosier, 1993; Stewart, 1983; Watson-Gegeo & Gegeo, 1989; Weisner & Gallimore, 1977; Zukow, 1989a, 1989b). Even without formal instruction from parents or from schoolteachers in how to teach younger children, siblings can provide very careful assistance as they teach younger siblings. The contribution of children to each other’s socialization is an important area in the study of culture and development.
1.1. Teaching and learning in Zinacantec Maya sibling interactions

Young Maya children teach their siblings to do everyday things, such as making tortillas and caring for baby dolls, in the context of their play activities. They typically use a Zinacantec style of teaching that varies from other styles of teaching that have been described, such as teaching at school (Cole & Cole, 2001). The Zinacantec model of teaching and learning includes observational learning, contextualized talk, bodily closeness between the teacher and the learner, highly scaffolded interactions, the expectation of obedience, and having more than one teacher for a given task (Maynard, 1996; Maynard & Greenfield, in press). In indigenous Zinacantec teaching and learning there is very little explicit verbal instruction (Childs & Greenfield, 1980), relative to the school model. Most learning of technical skills occurs through observation with carefully guided practice. The model reflects an overall pattern of teaching that centers around helping younger members of the culture become more competent participants in cultural activities (Maynard, 1999a).

Zinacantec children are first exposed to teaching at home with mothers or siblings, and only later are they exposed to a more formal model of teaching if they go to school. Generally speaking, models of teaching at home and at school may share features or they may be quite different. For example, schools emphasize the use of verbal discourse and decontextualized language, and many traditional, indigenous home learning environments do not (LeVine et al., 1991; LeVine, LeVine, & Schnell, 2001; Rogoff, 1981). Children who go to school are exposed to ways of thinking and learning that are often different from what they experience at home, especially when the culture of the school and the culture of the home are different (Gallimore, Boggs, & Jordan, 1974; Tharp, 1994; Trumbull et al., 2001).

Most formal education as conducted in schools provides exposure to a particular model of teaching, with one teacher in front of a classroom of students (Stigler & Hiebert, 1999). The teacher in formal schooling is usually someone unrelated and unknown to the children, and the relationship they have is characterized by distance, both physically and emotionally (Cole & Cole, 2001). These general findings are also reflective of the experience of Zinacantec children; when they go to school they are faced with a new way of interacting with teachers, a new set of materials and tasks, new values, and new scripts for a different kind of social organization.

In this article, the Zinacantec model of teaching and learning (Childs & Greenfield, 1980; Maynard, 1996; Maynard & Greenfield, in press) is the standard from which formal education is believed to differ. This forms the basis for understanding a cross-cultural phenomenon that appears, on the surface, to be occurring within the same cultural place: Zinacantec home culture is different from the school culture to which children are exposed, and the models of teaching are also different. While the development of the ability to use the Zinacantec model in teaching younger siblings has been explored (Maynard, 2002), the cross-cultural impact of schooling on children’s teaching has not been reported.

The way that children use information across these cultural milieus informs the study of transfer in cognitive development. The abstract representation of cultural tools, cultural models, and cultural goals provides the link between individual cognitive processes and the sociocultural context, and that the ability to form schematic representations is at the heart of the ability to perform cognitive transfer across domains (Guberma & Greenfield, 1991). If Zinacantec children can transfer a model of teaching at school to teaching activities at
home, it may indicate that they have abstracted the schema of teaching at school and can enact it at home, where the personnel, materials, and tasks are quite different.

2. Previous research on the effects of schooling

One of the primary goals of school is to promote children’s intellectual development, including skills in literacy and numeracy (Frazier & Morrison, 1998). Researchers interested in the impact of schooling on development have focused largely on the cognitive skills that one gains through attending school. Further, many studies have been published on the effects of schooling on performance on particular school-based tasks that measure these skills (Rogoff, 1981). For example, studies have shown varied results of the impact of schooling on logical thinking (e.g., Greenfield, 1966; Rogoff, 1981; Segall, Dasen, Berry, & Poortinga, 1999); memory (Cole, Gay, Glick, & Sharp, 1971; Rogoff & Waddell, 1982; Wagner, 1974); planning (Tanon, 1991); concept formation (Stevenson, Chen, Lee, & Fuligni, 1991); metacognition (Scribner & Cole, 1981); and literacy (Das & Dash, 1989; Scribner & Cole, 1981).

Although children’s intellectual development is the primary goal in formal schooling, recent evidence indicates that schooling also affects children’s psychosocial development (Frazier & Morrison, 1998). Researchers interested in the psychosocial effects of schooling developed psychological scales to study the development of the academic self-concept (Chapman, Lambourne, & Silva, 1990; Feshbach & Feshbach, 1987), children’s feelings of cognitive competence and peer and maternal acceptance (Frazier & Morrison, 1998).

Children’s performance on school-based tasks and their self-reports on psychological scales do not provide a complete picture of the effects of schooling on child development. Naturalistic observations of schooled and unschooled children’s social interactions are needed to inform the study of the effects of schooling on children’s social and cognitive development. An activity settings approach provides a useful tool for unpackaging aspects of teaching, both at school and in the context of the indigenous Zinacantec model.

3. Activity settings analysis of cultures of teaching

A longstanding theme in the study of development is that contextual factors shape pathways and processes through which the child passes (Cole et al., 1971; Light & Butterworth, 1992; Rogoff, 1990, 2003; Vygotsky, 1978). More recently, sociocultural theorists have argued that teaching is a cultural activity that can and should be studied as a cultural process (Gallimore, 1996; Stigler & Hiebert, 1999). Gallimore (1996) discusses the cultural nature of classrooms, pointing to the varied meanings of classroom activities for the participants, as well as the more objective features such as the personnel involved, the scripts for conduct, and the tools employed (Weisner, 1984). Activity settings analysis is a tool that can be used to study the activity of teaching across a variety of formal and informal learning contexts. Qualitative and quantitative data can be used to compare different settings across a number of features.
Table 1
Features of the Zinacantec model of teaching compared with the school model of teaching in an activity settings framework

<table>
<thead>
<tr>
<th>Activity setting feature</th>
<th>Zinacantec model</th>
<th>School model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Script/task</td>
<td>Observation (of socially-useful tasks)</td>
<td>Observation (of cognitive skills tasks)</td>
</tr>
<tr>
<td>Script</td>
<td>Contextualized talk</td>
<td>Decontextualized talk</td>
</tr>
<tr>
<td>Script</td>
<td>Bodily closeness with nonverbal teaching</td>
<td>Distance with verbal teaching</td>
</tr>
<tr>
<td>Personnel</td>
<td>More than one teacher</td>
<td>Only one teacher</td>
</tr>
<tr>
<td>Personnel</td>
<td>Heterogenous age groups</td>
<td>Homogeneous age groups</td>
</tr>
<tr>
<td>Primary motive</td>
<td>Socially useful tasks</td>
<td>Cognitive skills tasks</td>
</tr>
<tr>
<td>Values</td>
<td>Emphasis on closeness/personal relations</td>
<td>Emphasis on distance/less personal relations</td>
</tr>
</tbody>
</table>

This article uses activity settings analysis as articulated by Weisner and Gallimore (Gallimore, Goldenberg, & Weisner, 1993; Weisner, 1989a, 1989b; Weisner and Gallimore, 1985; Weisner, Gallimore, & Jordan, 1988). Based on the activity theory of Leont’ev (1981) and the ecocultural tradition of Beatrice Whiting (Whiting, 1980; Whiting & Edwards, 1988), the premise of Weisner and Gallimore’s approach is that activity settings are the most useful unit of analysis in the study of behavior because they provide opportunities for meaningful interactions in a given cultural context. Furthermore, activity settings analysis is useful to understand development because activity settings provide contexts for learning and for the child’s meaningful and increasing participation in culturally valuable practices (Weisner, 1989a).

Activity settings analysis provides a basis to compare features of teaching across the two domains of interest in this article: formal education at school and informal education in the context of the Zinacantec model of teaching and learning at home. The activity settings in which teaching is embedded influence child development by shaping the objective conditions surrounding teaching activities and the subjective meanings of those activities to the participants (Gallimore et al., 1993; Weisner et al., 1988). The meaning of teaching activities for the participants is a mix of features that can be assessed through ethnographic interviews, observations, and other careful forms of study. These features include the personnel present, the tasks themselves, scripts for conduct, the motives and emotional experiences of actors in the tasks, and the cultural values being communicated in the activity (Gallimore et al., 1993; Weisner et al., 1988).

Close examination of these features can help to elucidate processes of teaching, as well as the meaning of teaching and learning experiences for the participants. Activity settings analysis is used in this article to explore children’s teaching interactions. Two activity settings are considered, Zinacantec teaching at home and the model of teaching presented at school, in order to explore the relationship between the two models.

3.1. Activity settings analysis of the Zinacantec model of teaching

From the point of view of activity settings analysis (Table 1), the personnel in the Zinacantec model of teaching and learning are usually emotionally close and may be related,
such as in sibling groups or when a mother, aunt, or grandmother teaches a girl to weave. There can also be more than one person serving as teaching personnel for a learner. This arrangement of personnel is typical of other findings regarding informal teaching and learning, such as emotional and physical closeness (Cole & Cole, 2001; Lave & Wenger, 1991). The personnel in informal settings for learning are usually familiar with each other, and skills are orally transmitted, when necessary, with demonstrations in the context of production (Greenfield, 1984; Lave & Wenger, 1991).

In the Zinacantec model, teaching personnel follow a script where observation, contextualized talk, and bodily closeness are emphasized. Learners must observe a task before doing it themselves; thus Zinacantec children become very keen observers and do not have to “learn by doing;” or through trial and error. Zinacantecs typically only talk about a task while doing it; for instance, talk about the intricacies of weaving only occurs when weaving is being done. The primary motive of the Zinacantec daily routine is to accomplish socially useful tasks, such as running the household through chores. Children spend time in heterogeneous age groups, most typically the sibling group but also the group of cousins and godsiblings, and they learn to manage relationships with people of different ages and abilities in the context of learning how to do everyday tasks together.

3.2. Activity settings analysis of the formal model of teaching at school

From the point of view of activity settings analysis, the formal model of teaching at school looks quite different from the traditional Zinacantec model. The personnel in a school classroom typically include a single teacher and the students. Typically, students are approximately the same age as each other. Students do not interact much with people of different ages or abilities. The script for instruction in formal schooling usually involves a specialized speech register that requires children to gain literacy skills, with emotional distance (Cole & Cole, 2001; LeVine et al., 2001). The tasks that are taught in school are predominantly cognitive tasks designed to help children learn literacy and numeracy skills. Children may observe the schoolteacher doing a task, but trial-and-error learning is emphasized and the observations are of cognitive skills tasks, which may or may not be socially useful.

4. Hypotheses

The overall thesis of this article is that schooling affects the activity setting of sibling interactions at home in very specific ways related to discourse use and style. The discourse use hypotheses are that children who have been to school will: (1) use more verbal discourse in their teaching; (2) use more explanations in their teaching; and (3) teach more from a distance than children who have not been to school. These changes are expected to reflect the emphasis placed on verbal interactions at school, the decontextualized talk used in the school setting, and the physical distance of the teachers at school. The fourth hypothesis, concerning discourse style, is that children who have been to school will use a discourse style representative of the school model, and that they will resort to the more familiar Zinacantec model of teaching and learning when the school-based model is not effective,
resulting in an overall blending of the two models of teaching. The unschooled children’s teaching is expected to reflect the traditional Zinacantec model, which develops in everyday interactions without the influence of any schooling (Maynard, 2002).

5. Method

5.1. The Zinacantec study site

The study site is a Zinacantec Maya community, Nabenchauk, located in the highlands of Chiapas, Mexico, where I have conducted more than 14 months of fieldwork since 1995. All of my interactions in the village are in Tzotzil Maya, the language spoken by virtually all people in the community (the exceptions are a few women of Mexican descent who recently married Mayan men and moved into the village).

5.1.1. The schooling of children in Nabenchauk

In the community, schooling is not compulsory and overall schooling percentages are approximately 50% as of 2004, though the numbers are increasing (Maynard & Greenfield, 2004; see also Greenfield & Maynard, 1997 for a discussion of historical increases in schooling). Most Zinacantec boys and girls who do not go to school spend much of their time at home until about age 11, when they get more involved in work activities. At home, children help with chores and the care of younger siblings. Implicit in the role of sibling caretaker is the role of the older sibling as a guide or teacher of the younger siblings. Most teaching in the sibling caretaking relationship reflects the Zinacantec model of teaching and learning (Maynard, 2002). The teaching of siblings at home appears to develop in interactions with more experienced others (Maynard, 2002; Strauss et al., 2002; cf. Vygotsky, 1978). Data included in this article were collected to gain further understanding of the development of teaching when children are exposed to two different models: a model of formal education at school and the Zinacantec model of informal teaching and learning at home.

5.2. Participants

Participants were 53 Maya children ranging in age from 6 to 11 years ($M = 7.72$ years) and 35 of their younger, 2-year-old siblings. Children came from 35 households, each of which had an average of five children. Households were selected because there was a 2-year-old child living there. There was just one 2-year-old child per household. Although there were siblings in the families ranging in age from 3 to 5 years, only children who were age six and above were included in the analyses included in this article because that is the age at which most Zinacantec children entered kindergarten at the time the data were collected. Seventeen children had had some schooling, ranging from 1 to 2 years. The remaining 36 children had not been to school. The low rate of schooling may stem from the fact that the sample of children was relatively young and were spending most of their time at home with their mothers and other siblings.

Care was taken to avoid a selection bias in the schooled and unschooled samples. There was very little socioeconomic variance in the community at the time of the study. Perhaps
the strongest indicator of higher socioeconomic status in the community is owning a car. Families who did not own a car were just as likely to have children who went to school as families who did not. Further, agricultural families were as equally represented in the sample as families involved in commercial activity, and there were roughly equal numbers of schooled and unschooled children in each subsistence group. Families were also equated in terms of use of commercial products such as radios, televisions, and toys or other objects saved for children’s play activities. Families were equated also in terms of maternal schooling experience; there was only one mother who had been to school, and that was 1 year of kindergarten. Paternal schooling experience varied, but it was found not to have any effect on the variables under consideration in this article, including whether or not children had been to school.

5.3. Procedures

Participants were observed one time with a video camera in their own homes or courtyards for a period of one hour. Care was taken to familiarize the children with the video camera before taping began. Mothers were interviewed about the ages, work activities, and schooling experience of each person in the household. The reader is referred to Maynard (2002) for a more detailed description of the procedures.

6. Data analysis and measures

The first step in the analysis was to extract the teaching episodes from the longer tapes. For the present analyses the teaching segments were operationally defined as any task in which an older sibling engaged the younger child’s attention, verbally or nonverbally, in order to engage the younger child in the task. The teaching session was deemed to have begun when that happened. Teaching episodes ended when the focal child left the scene of the teaching episode, when the older sibling left the scene of the episode without returning, or when any child shifted tasks, thus beginning a new episode with a different activity.

There were 136 teaching episodes in the 35 h of tape where there were older siblings age 6 and above. This produced a total of 10 h, 57 min, and 3 s of teaching episodes included in the analyses. Teaching episodes ranged in length from 11.9 to 32 min, 9 s, with a mean length of 9 min, 57 s. Video data were analyzed using a software system designed specifically for video analysis, vPrism (Stigler, 1988).

Most children taught everyday tasks such as washing, cooking, taking care of baby dolls, and making tortillas. There was some teaching with books in the homes of children where an older sibling had been to school. The styles of teaching with books are compared across the children who had been to school and those who had not. The teaching episodes were transcribed and coded for measures of the development of teaching skills.

6.1. Measures: variables coded for quantitative discourse analysis

The impact of schooling on the children’s teaching was measured by verbal and nonverbal variables. The verbal discourse variables were: commands; explanations; feedback on the
child’s performance; and verbal teaching given from a distance. Commands, such as “Put it there!” were expected to reflect the intersubjective expectation of the older child that the younger child could follow instructions. Explanations were indicated by the teacher’s statement of the reason they were doing a particular activity, of the way an activity should be done, in anticipation of the outcome or final state of the activity being taught, or as a link to other kinds of activities. Feedback was expected to reflect the development of intersubjectivity and increasing powers of theory of mind and perspective taking. Verbal teaching given from a distance was expected to reflect the school model of teaching.

The nonverbal discourse variable was simplifying the task nonverbally. This was evident when a sibling broke down a task into doable parts for a younger child such that the younger child could do something with help that he could not yet do alone. For example, an older sibling might lay out a baby doll to wash, position the doll for the younger child, pour water over the doll’s head, and then ask the child to pour water over the doll’s head. Next, the older child might show the child how to rub the doll in a washing motion, and then ask the child to do that, going step-by-step through the process of washing the doll. An additional variable that involves the coordination of both verbal and nonverbal information was talk with demonstration. This was exhibited when a child narrated his or her current action, such as saying, “I’m washing” while moving the body in the position and action of washing.

Several of these discourse variables had been used by Childs and Greenfield (1980) in their study of weaving apprenticeship in the same field site. Some variables were derived from previous studies, such as Zukow’s (1989b) study of sibling socialization, Zukow-Goldring and Ferko’s study of the socialization of attention (1994), Ashley and Tomasello’s (1998) study of collaboration in preschoolers, and Tomasello and Mannle’s (1985) study of pragmatics in sibling speech in young children. Each variable reflects some aspect of cognitive development, such as the ability to take the perspective of the younger child in order to provide the correct guidance in the task. The variables were also expected to be related to school in specific ways. For example, the verbal discourse variables were chosen to reflect the extent to which the children used verbal discourse to teach tasks, with the expectation that schooled children would talk more than unschooled children. For the quantitative analyses, frequency counts were taken for each of the measures and then divided by the number of minutes the teacher was involved in a teaching activity to control for overall variance in the time different siblings spent teaching the younger child.

### 6.1.1. Reliability

Because the data were all in Tzotzil, the primary coder for both coding schemes was the author. An independent coder, fluent in the Tzotzil language and unaware of the hypotheses, coded 25% (N = 9) of the videotapes. Inter-rater agreement for the number of episodes, assessed by percentage agreement, was 95.2% (40 of 42).

Inter-rater agreement for the duration of episodes was assessed by examining the two raters’ beginning points and endpoints of every episode where there was agreement that there was an episode. The number of seconds of disagreement was compared. For the beginning points of episodes, the disagreements ranged from 0.66 to 29 s, with a mean of 10.7 s. For the endpoints of episodes, the disagreements ranged from 1 to 30 s, with a mean of 11.8 s.
Inter-rater agreement for the discourse measures was assessed by Cohen’s Kappa. For all the discourse measures taken together, Kappa (κ) = .80 (percent agreement was 84.6% for all the discourse variables). This Kappa value is considered to be indicative of excellent reliability (Bakeman & Gottman, 1986).

7. Results

There were no differences across the schooled and unschooled children in the amount of time they spent teaching. Therefore, for purposes of statistical analysis, the codes for the discourse variables were divided by each teacher’s time spent in teaching to control for variations.

7.1. Hypotheses 1 and 2: schooling and use of the discourse variables

Because age is correlated with schooling, age is a covariate in the analysis of the effects of schooling on the discourse measures. This analysis should make clear the effects of schooling after accounting for age. The data were analyzed by a between-subjects, one-factor (Schooled vs. Unschooled) MANCOVA with age as the covariate. Taking the age of each child teacher into account, there was an overall effect of schooling on the children’s use of the discourse variables, F(1,51) = 3.477, p < .01 by Wilks’ criterion (Fig. 1). This means that the schooled children talked more than the unschooled children. However, there was only one significant effect of schooling on an individual variable: explanations (F(2) = 3.988, p = .025). This may be because the subjects in the sample had only 1 or 2 years of schooling, typical for children in the age range examined (6–11 years) in the study population. There were no effects of schooling on the children’s practice of simplifying tasks for learners. Both schooled and unschooled children broke down tasks for learners to help them participate in the interactions.

Fig. 1. Means of the discourse variables (controlled for time teaching) by schooled and unschooled children.
7.2. Hypothesis 3: schooling and distance teaching

Another variable of interest was whether schooled children gave more commands from a distance. Only six (16.67%) of the 36 of the unschooled children taught from a distance, while 13 (76.5%) of the 17 schooled children did so. A $\chi^2$-test indicated that schooled children taught more from a distance than unschooled children, $\chi^2(1, N=53) = 17.958, p < .0001$. However, a limitation of the $\chi^2$-test is that it does not allow one to test for the effects of a covariate. Distance teaching was not only a function of schooling, but it could be a function of age as well, if the older siblings had expectations of obedience from the younger siblings. Therefore, a between-subjects, one-factor (Schooling) ANCOVA with two levels (Unschooled vs. Schooled) was run to test the impact of schooling on distance teaching with age as a covariate. The ANCOVA indicated that children older than 6 years who had been to school used significantly more distance teaching than children who had not been to school, $F(1,50) = 4.10, p < .05$. The covariate, age, was also a significant factor in the analysis, $F(1,50) = 4.14, p < .05$. This is expected when the dependent variable and the covariate are correlated, as they are in this case, $r_p(53) = .30, p = .03$. This finding suggests that schooling is a factor in the use of distance in children’s teaching. Clearly, verbal teaching from a distance is not normative in Zinacantec sibling socialization. Distance is characteristic of school instruction where a teacher stands in front of and apart from the whole classroom.

7.3. Hypothesis 4: a shift in the activity setting and discourse of teaching

As we have seen, there was a significant relationship between schooling status and the discourse variables. The best way to illustrate the shift in teaching style for schooled children is with some contrasting examples. In the first example, an unschooled child, Paxku’, age 8, is teaching Chepil, age 2, how to wash a rag. They are sitting close together inside their house, while adults are talking outside. Paxku’ manages to listen to the adult conversation that is going on outside while scaffolding Chepil’s washing. A more complete corpus of transcripts is found in Maynard (1999b).

7.3.1. Example and analysis of teaching in terms of the Zinacantec model

Paxku’, age 8, with Chepil, age 2: Teaching washing. Paxku’ and Chepil are inside the house. Paxku’ has gathered all the material necessary to teach Chepil how to wash: a rag, a bottle for pretend soap, water, and some small dishes and a bottle for pouring small amounts of water onto the rag. She sits very close to Chepil, their bodies touching, and says to him, “Wash!” as she demonstrates the action she wants him to do. When he does not respond after a few seconds, she shows him again and repeats, “Wash, baby!” Their six-year-old sister, Rosy, then brings a piece of wood to serve as a washboard for Chepil to wash on. Paxku’ pours water onto the rag and then says, “Wash! Wash the cloth that carries you! Wash! Wash your cloth,” as she repeatedly demonstrates the action she wants him to do. She helps him to move his body into the angle for washing, kneeling over the rag and the washboard like she is. He does a little of the washing motion. Paxku’ then says, “Wash this now! Look!” as she again does the washing action. Chepil washes the rag, moving his body in the correct way. Paxku’ then tells Rosy to make them some pretend food, and goes back to pouring water for Chepil from a small bottle. Then she gives him the small bottle for him
to pour water himself, which he does. She says, “Look. Wash here.” Chepil is interested in another bottle and picks it up to use it for washing. Paxku’ immediately moves his hand away saying, “Don’t touch that!” So he uses the original bottle she had given him instead. He continues washing as the group play continues.

The Zinacantec model of teaching is evident in this interaction. The personnel are organized in teaching Chepil how to wash the rag. Paxku’, the oldest child present, sets up the situation and gives Chepil verbal and nonverbal instruction in washing. Rosy, their 6-year-old sister, comes in to bring a makeshift washboard. Paxku’ asks her to make some food. The task in the example is washing and the tools are water, small bottles and containers, a washboard, and the rag. The script for the activity has features of the Zinacantec model of teaching and learning: the older siblings are organized as multiple teachers for Chepil, and they stay consistently close to him. Whenever the two older sisters teach Chepil something, either verbally or nonverbally, they are quite close to him. Paxku’ never leaves Chepil’s side; they are in bodily contact the entire time.

The next example, also of the teaching of washing, depicts a child who has been to school as she teaches her youngest, 2-year-old sibling how to do the activity. Rosy, age 9, is the oldest child, and she has been to school. She coordinates the actions of the younger children, Xunka’, age 6, Esteban, age 4, and Patricia, age 2.

7.3.2. Example and analysis of two models of teaching: the Zinacantec model and schooling

Rosy, age 9, Xunka’, age 6, Esteban, age 4, and Patricia, age 2: Teaching washing. Patricia and Esteban are in the backyard playing. Rosy enters and places a bucket with a piece of clothing in it between Esteban and Patricia. Then she directs both of them in washing. Esteban expresses that he wants the pants in the bucket. Rosy goes to get something else. She returns with another bucket into the frame. Esteban sees that she has the pants as Rosy is putting the bucket in between the two children. Patricia moves the bucket away from Esteban. He says, “Hand me the pants,” as he reaches for them. Patricia protests with a baby talk sound. Esteban asks for a bucket from Rosy. She says that they are going to do their washing. Rosy then retreates to watch the washing at a distance and says, “Wash! Wash!” Esteban says, “Let’s wash!” And he does the washing action with his threads. He says to Patricia, “Hand me a little water.” She protests, saying, “Aaaw,” as she looks to the water in her bucket and touches her bucket. Rosy enters to help Patricia wash and says, “Wash Patri!” Rosy then narrates her action of removing the pants from the bucket, “Take out—take out the washing here. Wash! Put soap on your washing here,” and she shows the washing movement. She then pretends to put soap on the washing. Xunka’ then enters with a glass of water and says to Rosy, “Look. Look.” Rosy tells Xunka’, “Give to him [so that] he can see it,” directing Xunka’s action. Rosy retreats, to watch the washing from a distance. Rosy then approaches Patricia again to add water to Patricia’s bucket, pouring from the big bucket. Esteban continues his washing action, not engaging Patricia. Eventually he knocks over a glass of water, and they all laugh. He asks Xunka’ to “Draw some water and bring it back!” Xunka’ runs off to get Esteban some water. Patricia then looks at what Esteban is doing and imitates the action of washing. Rosy exits the scene completely. Xunka’ notices that Rosy has gone and brings water for Patricia and Esteban. “Look at this!” she says, and gives water in a glass to Esteban. She then pours some out
of a glass for Patricia. Esteban and Patricia continue washing. Xunka’ then says, “I am making the foods,” as she goes to get leaves off a tree to serve as greens in her cooking.

There are two models of teaching that are evident in this interaction: the Zinacantec model and the school model. From an activity settings perspective, the personnel are organized in the teaching of Patricia. Each person’s role is consistent with that child’s developmental capabilities (Maynard, 2002). Rosy, the oldest, sets up the situation and gives both verbal and nonverbal directions about washing. Esteban, the four-year-old child, helps Patricia by serving as a model of the action being taught that she can observe. Xunka’, age 6, helps by bringing needed water. The task is washing and the tools are water, buckets, and clothes. The script for the activity has features of both the Zinacantec model of teaching and the school model: the older siblings are organized as multiple teachers of the youngest child, but they are not within close bodily range.

It is helpful to look at the aspects of the school model of teaching in more detail. Rosy, a 9-year-old girl who has been to school, provides the focal child with things to work with and then tells her what to do from a distance. She does not share the physical perspective of the child. She enters to help for only a few seconds, shows the child what to do as she describes it, and then retreats to watch again from a distance. Rosy’s teaching style is more like the model of formal education she has been exposed to at school: at first she instructs verbally from a distance and an unshared perspective. After the focal child does not comply, Rosy steps in to demonstrate and describe the action at the same time, sharing the perspective of the child, a style which is more typical of the Zinacantec model of teaching. Finally, Rosy retreats again to the distance to continue teaching by giving orders to the focal child.

Rosy’s distance teaching exemplifies the attempts of schooled children in the larger database to engage their younger charges through commands or talk given from a distance. In addition, the verbal instruction without a nonverbal demonstration may be a variation of the school model of teaching. Though directives appeared also in the behavior of children who had not been to school, they were simple commands to fetch a particular item or to repeat an action that was already in progress. In the database, there were very few examples of unschooled siblings issuing commands from a distance to their younger siblings.

It is interesting to note that the other children in the example have not been to school. Esteban, age 4, stays very close to Patricia the entire time, serving as an observational model. Xunka’, age 6, also provides direct assistance to Patricia within close range. Older, unschooled siblings were more likely to remain close to the 2-year-old children, carefully guiding them through new activities with narrated demonstrations.

In addition, 14 months of ethnographic observation of mothers and children produced no examples of mothers trying to instruct children from a distance. Mothers, all but one of whom had not been to school, typically were close to their young children as they guided them through tasks, such as washing or making tortillas.

One might claim that a child from a Western culture might have a similar strategy to that of the Zinacantec child, to move in and demonstrate the action after attempts to teach through a more distant strategy were unsuccessful. The claim being made here is that the Zinacantec children’s teaching becomes more like the Western children’s teaching as a result of schooling. School is a kind of equalizer in terms of models of teaching. What is at issue is not that the Zinacantecs and children from other cultures might make the shift
from a more formal, school style of teaching to a closer, more intimate style of teaching. What is being claimed is that the Zinacantecs who have not been to school do not initially or naturally attempt a more distant style; that style comes from exposure to the activity setting and model of the school. It is the relative emphasis on closeness in the traditional Zinacantec model of teaching that makes it different from the model of school teaching.

7.3.3. A shift in discourse style in interactions with books

The impact of schooling can also be observed in the context of the children’s interactions with books. There were dramatic differences between the children who had been to school and the children who had not. The children who had been to school were more likely to look at a picture on the page and then elaborate on it, providing a story of the picture ($\chi^2 = 5.091$, $p = .024$). There were only four children (out of 36) who had not been to school who provided elaborations on things seen in books; these children had at least one older sibling who had been to school who could have transferred some knowledge about books and elaborating on what one sees in books. Un schooled children typically said, “Look, look” as they pointed to pictures on the pages. Elaborations on the part of the schooled children reflect a discourse style more prevalent in schools than in everyday Zinacantec life. Zinacantecs tell stories with a particular theme or purpose, often to report news or to tell a folk tale or a moral story; they do not elaborate on pictures of or ideas about arbitrary events or people.

8. Discussion

This article examined the interaction of an indigenous model of teaching found at home with a model of teaching found in school. There was evidence of transfer from the activity setting of school to the sibling activity setting at home. Zinacantec children’s discourse practices were affected by their experience with school such that children who had attended school for even a year or two used more verbal discourse in their interactions and taught more from a distance than their unschooled siblings. Schooled children also gave more explanations than their unschooled counterparts, reflecting the pattern of decontextualized talk seen in school. Interestingly, children who had been to school often tried the school model of teaching from a distance with much verbal discourse until they realized that that model was not resulting in the younger child’s compliance in doing the task. The older siblings would then provide direct nonverbal, scaffolded help to the learners, in close bodily contact, more consistent with the Zinacantec model of teaching and learning.

These findings reflect the impact of the school model of teaching on the children’s socialization practices. The children in this study who had been to school used both the model of teaching they were exposed to at school and the model of teaching they were exposed to at home. As more and more Zinacantec children attend school, and attend for longer periods of time, new changes are expected. As the children in this sample mature in their roles as sibling caretakers, they are likely to pass on more of the aspects of schooling, such as literacy and numeracy skills and the discourse style used in school.

The fact that the Zinacantec children who have been to school so readily take up the school model may indicate cognitive flexibility and the transfer of the cognitive model of teaching presented in school. It appears that the children abstracted a model of teaching at
school and transferred it to home interactions. This argument seems plausible, given that the conditions suggested by Guberman and Greenfield (1991) to foster cognitive transfer are met: the use of the teaching model has been abstracted after being exposed to it in more than one context (home and school); the child has had the opportunity to reflect on the structural similarity of teaching in the two contexts; and the child has been able to explore teaching in a context with low goal specificity, play with siblings. The uptake of the school model may also reflect the perception of greater power and authority held by the schoolteachers. The questions of transfer and the perception of status could be tested empirically in future research.

While the impact of the school model on the indigenous Zinacantec model of teaching is of interest, the simple fact that children teach each other to do cultural activities in their everyday interactions is also significant. Children are “effective socializing agents” (Zukow, 1989b, p. 79), as they teach each other to do cultural tasks. They are capable of teaching each other culturally-relevant tasks, in addition to the contrived, laboratory tasks used in many studies of children’s interactions. The data for this study were collected as children interacted in their home environments with their siblings or close relatives who were responsible for their care on a daily basis, without an imposed agenda or task. By observing children in their everyday settings, as they used materials they were familiar with, with a person or people they were familiar with, for as much time as they wanted, this study has contributed to our knowledge about children’s activities and what they do when they are alone together.

A related issue is the process of cultural transmission and child socialization. This study of cultural teaching has informed our knowledge of the transmission of culture. Indeed, everyday tasks are taught by more than mere legitimate peripheral participation (Lave & Wenger, 1991). Moreover, this study helps to validate children’s contributions to each other’s everyday routines in a very specific way: by illustrating the verbal and nonverbal tools children use to help each other participate in their culture. Children create culture at the same time that they are acquiring culture. As they are being socialized by their parents, they also socialize, in their own way, their younger siblings.

Just as children are equipped to acquire culture through processes of cultural learning, so are they also equipped to transmit culture through cultural teaching. The skills that children use in teaching their younger siblings to do everyday tasks come from the fabric of the culture around them, as exhibited in a variety of activity settings where teaching and learning occur. Children play and teach what they know and what they are also learning how to do at the same time, and they adopt models of teaching from the activity settings in which they are involved. As children are making the transition from play to work, they are able to pass valuable skills on to their younger siblings through both implicit and explicit teaching. The abilities that they develop over the course of middle childhood make the transmission of culture possible, during childhood and beyond.

We have seen that the school model of teaching can blend easily into everyday sibling interactions. The school model can blend into parenting interactions as well. It is important to follow the impact of schooling as the children in this study become parents. Perhaps they will behave in ways similar to other parents, and mothers in particular, who have been the first in their communities to go to school. Mothers who have been to school have fewer children, they are more likely to seek medical care for their families, and they speak
differently to their children, reflecting a shift toward the institutional discourse of school (LeVine et al., 1991, 2001). Most of the data collected on the effects of maternal schooling have been collected with adult women who experienced schooling during childhood or adolescence. In many communities, those mothers had been the first girls to go to school, but the effects on their relationships at home were not considered. This article has provided some understanding about the effects of schooling when siblings go to school and their mothers have not.

A limitation of this study, however, is that it is not clear why some of the children go to school and others do not. The variance can be accounted for, in part, by the young ages of children in the sample. Children in Nabenchauk tend to start kindergarten at age six or seven. They may then take a year off before going back to first grade. This later age at starting school, combined with intermittent breaks in attendance, and the fact that many children are held back if they are not performing well, leads to much older average ages (approximately age 15 or 16) for finishing the sixth grade, the highest grade attainable in the village at the time of the study (schoolteacher Ramiro Sanchez Hernandez, personal communication, May 28, 2003). Still, the factors usually related to schooling, such as socioeconomic status and parental schooling, were not related to these children’s participation in school.

As with other areas of cross-cultural investigation, the study of teaching practices has revealed that there is both variation across cultures in some aspects of teaching, such as arrangements of personnel in space, and that there are aspects of teaching that do not change, such as the theory of mind skills involved in knowing what a learner knows and doesn’t know in order to teach him (Strauss et al., 2002). Further research is needed to discover the ways that teaching found in schools affects local ethnotheories of teaching and learning, and the ways that these models are actualized in children’s interactions. Research on teaching and learning should be guided by the notion that there are varieties of cultures of teaching, with scripts for personnel who engage in activities, motivated by cultural values.

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