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9 A Cultural/Historical View of Schooling in Human Development

Barbara Rogoff, Maricela Correa-Chávez, and Marta Navichoc Cotuc

In this paper we examine changing arrangements of human development that have accompanied societal shifts to mass, compulsory "Western" schooling. We draw attention to the often taken-for-granted role of schooling in children's lives once extensive schooling has become the childhood norm in their communities. To do so, we examine two cases, involving very different histories and current conditions. We first examine the life patterns associated with the growth of mass schooling across the past centuries for European-heritage families in the United States, integrating the work of historians who have described the process. Then we examine the phenomenon across three generations of Mayan families in Guatemala, using our own interviews and observations.

In the United States one can generally assume that if a child is 6 years old, she is in the first grade, or if a child is in the first grade, she is about 6 years old. As Irwin et al. (1978) put it, "In Western industrialized countries, going to school has the same inevitability for children that death and taxes have for their parents" (p. 415).

Although psychologists often identify developmental transitions in terms of children's ages, age indexes *both* biological maturation and changing roles in cultural institutions.[1] As White (1975) has pointed out, age 5 to 7 years has for some centuries marked societal shifts in treatment of children, such as the standard onset of formal schooling in Europe and the United States. White and Siegel (1984) argued that a key feature of child development is the increasing involvement of children in wider societal institutions.

[1] Attention to the role of schooling and other societal institutions in children's lives does not require a mechanistic environmental causality view. We view biological maturation and engagement in cultural activities as mutually constituting each other (Rogoff, 2003).

Nonetheless, researchers commonly interpret children's age as simply a measure of maturation or general experience with the world (Wohlwill, 1970), overlooking the near-perfect association of age with experience in school in nations with compulsory schooling (Laboratory of Comparative Human Cognition, 1979). Indeed, European-American developmental transitions often center on children's participation in schooling, with children's development categorized in terms of progress in this institution: preschoolers, elementary age, high schoolers. Many studies have noted the relation of schooling to specific aspects of performance on cognitive tests (Rogoff, 1981; Sharp, Cole, & Lave, 1979). The common contemporary practice of equating children's development with age may be related to schooling's organization according to age and to the historical role played by developmental psychologists both in documenting changes according to age and in designing schooling.

Extensive experience with Western schooling appears to play a formative role in organizing childhood, for children and their parents worldwide. We are not arguing that it does so solo, but that its structure and practices play a role in shaping what developmental psychologists often think of as ordinary child development (Packer, 2001). The current ubiquity of Western schooling in the lives of children in most researchers' communities has made it difficult to discern alternative ways that children's lives have been structured in other times and places. This institution is taken for granted due to inevitability of many years of involvement, and treated almost as a 'natural' part of growing up. This 'naturalizing' of institutional experience makes sense:

> The members of an institution need not necessarily have been its originators; they may be second, third, fourth, etc. generation members, having "inherited" the institution from their forebears. And this is a most important point, for although there may be an intentional structure to institutional activities, practitioners of institutional forms need have no awareness at all of the reason for its structure – for them, it is just "the-way-things-are-done." The reasons for the institution having one form rather than another are buried in its *history*. (Shotter, 1978, p. 70)

Several key features of children's lives in societies with extensive schooling – segregation from adults into a children's world, association with peers in tightly limited age cohorts, comparisons of development according to age – arose in the recent history of compulsory, mass schooling.[2] Family

[2] Although formal instruction in societal institutions occurs in many societies other than those with formal Western schooling (Akinnaso, 1992), other forms of schooling generally do not oblige mass, universal instruction.

changes – such as decreases in family size, infant mortality, and children's contributions to sibling care and other family work – accompanied these shifts.

Schooling's association with age-graded segregation from both adults and children of other ages restricts children's opportunities to learn from observing and becoming involved in the mature activities of their communities (Rogoff, 2003; Morelli, Rogoff, & Angelillo, 2003). The limited opportunities to observe and be involved in ongoing activities may increase the likelihood that children depend on others to organize their attention, motivation, and learning of the information and skills required in maturity, as in schools (Rogoff, Paradise, Mejía Arauz, Correa-Chávez, & Angelillo, 2003).

In a *Scientific American* article written more than a quarter of a century ago, Bronfenbrenner argued that unhealthy changes were arising because of the segregation of children from community and family life, due to the structure of societal institutions such as industry and schools:

> If a child is to become a responsible person, he not only must be exposed to adults engaged in demanding tasks but also must himself participate in such tasks. . . . Our children are not entrusted with any real responsibilities. Little that they do really matters. They are given duties rather than responsibilities; the ends and means have been determined by someone else and their job is to fulfill an assignment involving little judgment, decision making or risk. This practice is intended to protect children from burdens beyond their years, but there is reason to believe it has been carried too far in contemporary American society and has contributed to the alienation of young people and their alleged incapacity to deal constructively with personal and social problems. The evidence indicates that children acquire the capacity to cope with difficult situations when they have an opportunity to take on consequential responsibilities in relation to others and are held accountable for them. . . . The institution that has probably done the most to keep children insulated from challenging social tasks is the American school system. (1974; p. 60)

In the ensuing decades, U.S. children have become further segregated from mature community and family lives and spent greater time as the wards of bureaucracies. Children under 5 and youths over 16 spend more and more time in institutions that separate them from the ordinary, productive lives of adults.[3]

Developmental psychology is an active player in the story, as White has pointed out in his historical accounts of this field's role in designing

[3] As of 1987, more than a third of 3- to 4-year-olds and almost a fourth of 20- to 24-year-olds were in school (Angus, Mirel, & Vinovskis, 1988).

institutions of modern society (especially those addressing health, education, and welfare) and in establishing normative developmental markers and milestones associated with particular ages and schooling. During the 20th century, the new field of developmental psychology grew to play a role in designing methods and ideas for use by "'distal bureaucrats' who do not deal predominantly with flesh-and-blood children, families, or practitioners but with symbolic representations of large numbers of them" (White, 1999, p. 12).

Developmental research has made key contributions to the design of cultural institutions and practices that are now central to U.S. childhood: "Child science . . . legitimated the idea of age-graded elementary education, . . . classified students based on the construction of the concept of intelligence quotient, and . . . psychologists [were] enlisted as the appropriate arbiters of developmental truth in American society" (Hawes, 1997, p. 65).

Coming to a clearer understanding of the role of the ubiquitous institution of schooling in the lives of U.S. children and families, and its growing role worldwide, is important for illuminating the nature of child development. In addition, an understanding of the historical/cultural role of schooling is essential for considerations of researchers' and policymakers' future contributions to the design of institutions and practices for children in the United States and worldwide. In this paper, we first review the growth and roles of schooling for U.S. children and families across several centuries, and then we examine data regarding the growth and roles of schooling for Guatemalan Maya children and families over three generations.

Compulsory Mass Schooling in European-American Communities

It has only been for about a century that U.S. childhood has routinely and extensively involved school attendance. In colonial America, families were expected to teach children to read at home (Getis & Vinovskis, 1992). Before 1800, only 40%–60% of the U.S. male population attended school, usually for only a few years (LeVine & White, 1987). The school day and school year were also shorter than at present, and less central to the learning experiences of childhood.

With the onset of industrialization in the 1800s, schooling increased. In 1830, 35% of white children ages 5 to 19 attended school; in the 1870s, the figure had increased dramatically to 61% (Chudacoff, 1989). Enrollments in public school increased three-fold from 1840 to 1900 and most children completed several grades of elementary school; in 1910, three fourths of the population over age 25 had five or more years of schooling (Myers, 1996).

As industrialization spread, in the early 1900s, schooling was made compulsory and time spent in school increased (Chudacoff, 1989; Hernandez, 1994). Compulsory schooling was sponsored by movements that also restricted children's work – labor unions tried to protect jobs for adults, and child welfare workers attained laws protecting children from dangerous working conditions (Bremner, 1971; Chudacoff, 1989; Hernandez, 1994). From 1870 to 1940, school enrollment increased from 50% for children aged 5 to 19 years to 95% for children aged 7 to 13 years and to 79% for children aged 14 to 17 years.

Children who were enrolled also became more regular in their attendance (LeVine & White, 1987). The number of days spent in school each year doubled between 1870 and 1970, rising from 78 days to 162 days attended per enrolled student (Angus, Mirel, & Vinovskis, 1988).

In addition, higher schooling became required for economic advancement. In 1889–1890, enrollment in secondary schools in the United States included only 7% of 14- to 17-year-olds; in 1919–1920, 32% were in school, and by 1929–1930, 51% were enrolled (Chudacoff, 1989). By the middle of the 1900s, most U.S. children and youth spent a great deal of their day at school or, given the increases in schooling across generations, interacting with their rather extensively schooled parents and siblings (Hernandez, 1997).

Changes in the Role of Schooling in Children's Learning

Along with the change to enrolling all children, the purposes of schooling and its role in children's learning have changed since it began to be a mass, compulsory institution. For example, the definition of functional literacy has transformed greatly over this time (Myers, 1984, 1996; Resnick & Resnick, 1977; Wolf, 1988): In the United States of the 1700s and the early 1800s, the definition of literacy was being able to sign one's name or an X to legal documents. In 1800, only 58% of Army enlistees were able to sign their names; in the 1880s, 93% were able to do so (Myers, 1996).

> The purpose of schools was to teach students to sign their names, to make lists, to record information, to copy word lists, to read a few essential words, to read a few things aloud from memory, to have some awareness of how devotional books were organized, to know some religious passages "by heart," to know how to write a few numbers, to be able to arrange numbers in inventory columns, and, possibly, to be able to do a few, simple arithmetic calculations. (Myers, 1996, p. 49)

It was not school's job to teach children about the world; this was usually up to the family, and it often did not involve the use of books. As much as half of the U.S. population did not have books in their home in 1859 (Myers, 1996).

In the late 1800s, literacy became the ability to read and recite memorized passages, not necessarily with comprehension (Myers, 1996; Resnick & Resnick, 1977). This shift occurred as the United States sought order in recovering from a civil war and in incorporating influxes of immigrants,[4] and as industrialization spread.

With the decrease in children sharing in the family work on the farm – the most common setting of U.S. childhood until this point – the responsibilities of schools changed. Schools were given the job of teaching children obedience, industriousness, and punctuality (Graff, 2001). They taught primarily through a "drillmaster" model, leading children in unison in reciting their lessons and testing how many texts and facts from the text they could recite (Myers, 1996).

> The acts of reciting passages aloud, giving reports aloud, summarizing a version of literal meaning (metaphorical and historical), learning to write some, learning diction, and learning to copy dictation were intended to socialize children from homes where one parent was home all day; to teach English to nonnative speakers; to socialize immigrants and natives into U.S. traditions; to overcome the shortage of printed materials in schools; to police the student population by teaching them "discipline;" and, according to many observers, to sort the population, even where segregation laws had been dropped, into segregated groups based on gender, economic class, and race or ethnicity. (Myers, 1996, p. 75)

In the early 1900s, the definition of reading began to involve literal understanding of unfamiliar passages. At this time, Army testers sought recruits for World War I who could read instructions for operating equipment, and the efficiency goals of increasingly centralized industry required workers who could extract information from text (Myers, 1996; Resnick & Resnick, 1977).

[4] By 1909, 58% of students in the 37 largest U.S. cities were children of immigrants from 60 different ethnic backgrounds (e.g., 72% in New York, 67% in Chicago, 64% in Boston; Cremin, 1961). With increasing diversity and numbers, New York City undertook bureaucratization of the school system as early as the first half of the 1800s, seeking the efficiency of labor-saving machinery by breaking the curriculum into small steps and regimenting students as well as teachers in the beginnings of a uniform system (Kaestle, 1973).

Schooling became centralized, with many regulations for sequence of instruction and forms of assessment, and with many administrators to oversee the bureaucracy. Although teachers still relied heavily on questions to structure their engagement with students, the system of instruction no longer included reciting whole passages but rather focused on "bits-and-pieces interrogation of the student's mind" (Myers, 1996, p. 87).

> This shift from oral recitations of whole pieces to oral answers about smaller bits meant that most classrooms began to seem like quiz shows focusing on small bits of information, not the memory dumps of whole pieces typical in many traditional recitation classes. (Myers, 1996, p. 88)

Industrial models were used to transform the organization of schooling, employing "rational" models based on assembly line efficiency as in Ford's factories (Packer, 2001; Tyack & Tobin, 1994). The "scientific management" approach promoted by the new cadre of school administrators fit well with E. L. Thorndike's idea of organizing instruction and measurement around "elements." Thorndike's 1904 book (*An Introduction to the Theory of Mental and Social Measurement*) advocated that teachers should break tasks into sequenced parts, have students repeat each part in order and often, and reward students with grades or stars or other forms of feedback (Myers, 1996). The invention of the multiple choice test item followed a decade later.

Metrics were also developed to compare students – both IQ testing and standardized grades. Grading on a curve was introduced by Max Meyer in 1908 in the journal *Science* (proposing that the top 3% be ranked excellent, the next 22% labeled superior, the middle 50% judged medium, the next 22% inferior, and the bottom 3% failing). Standardized grading on a curve and IQ testing spread widely a few years later during the era of "scientific efficiency" in which education experts and administrators applied industrial models for factory production to schools.

> Since Americans were, in the first 30 years of the twentieth century, inundated by dozens of immigrant groups who were so radically different first from "Americans" and then from each other, the emphasis on differences now measurable by scientifically validated tests was translated from the realm of the senses to that of statistics. This made the differences seem firmer, sharper, and also more controllable. At a time when democracy seemed threatened by heterogeneity, counting, sifting, and ranking provided a form of order and containment. (Fass, 1980, p. 439)

However, by the end of the 20th century, "higher" levels of literacy were expected for all U.S. children, requiring them to make inferences and develop ideas through written material. This was the first time that critical literacy was set as a goal for all children, although some children of the elites had this goal long before (Myers, 1996; Resnick & Resnick, 1977; Wolf, 1988). Of course, some of the structures of schooling that developed in the old factory model, such as use of age and standardized tests to organize the treatment of children, have become "naturalized" in conceptions of childhood and of learning in highly schooled societies.

Use of Age As a Metric of Human Development

Age became a measure of development and a criterion for sorting people, with the rise of industrialization and efforts to systematize human services such as education and medical care in the last half of the 1800s in the United States and some other nations (Chudacoff, 1989). Specialized institutions were designed around age groups. Developmental psychology began at this time, along with pediatrics, old-age institutions, and age-graded schools.

Before this time, people in the United States often did not know their ages, and students advanced in their education as they learned (Chudacoff, 1989). Over the past century and a half, the cultural concept of age and associated practices relying on age-grading have come to play a central, though often unnoticed, role in ordering lives in the United States.

Age-Graded Bureaucracies. Bureaucratic institutions for children such as school often cluster one-year age groups for adults' convenience. Until large numbers of children were required to attend school, dividing children according to age was not involved even in schooling's ordering of the curriculum (Chudacoff, 1989; Serpell, 1993). Gradations based on students' progress through the curriculum began in the 1500s in European schools; the levels were not determined by time since birth (Ariès, 1962; Serpell, 1993).

Rough gradation based on age began in the early 1800s, with the usual very wide age range narrowing to about a six-year range within a given class (Ariès, 1962; Serpell, 1993). In North America of the late 1700s and early 1800s, there was not a standard age of entry or completion, and it was not unusual for 3- or 4-year-olds to be in the same classroom as teenagers (Angus, Mirel, & Vinovskis, 1988; Chudacoff, 1989).

> Since children differed widely with respect to when they had begun school, how many terms they had attended, how regular their attendance had been, how much time they could find at home to study, and so forth, not to mention differences in talent and motivation, age was a poor predictor of which child would be studying at which level in each subject. Teenage boys who had grown up out of the reach of a school might find themselves learning the alphabet alongside children of four or five. (Angus, Mirel, & Vinovskis, 1988, p. 216)

In the mid-1800s, a system of "graded instruction" was developed that ordered the subjects to be taught into a sequence according to difficulty, and arranged them into the amount of work expected in one year for the average child (Angus, Mirel, & Vinovskis, 1988; Hamilton, 1989). However, the children were advanced through these grades on the basis of their attainments, not their age. Some efficiency accompanied the grouping of children according to their level of accomplishment, and teachers began to instruct the whole class, giving the same lesson to all, rather than having individuals or small groups recite.

In the late 1800s, segregation of U.S. schoolchildren by age became formalized, when the schools instituted standard starting ages as part of the legal requirements of compulsory schooling. Age-grading served bureaucratic needs, in the face of great increases in the numbers of schoolchildren (due in part to industrialization, urbanization, and immigration). Handling instruction bureaucratically also followed the preference of the late 1800s to organize a "rational" system of uniform classification, curricula, textbooks, and discipline, using age as a metric to categorize pupils within the efficiency model of the factory system (Chudacoff, 1989).

> Awareness of age and the age grading of activities and institutions were part of a larger process of segmentation within American society during the late nineteenth and early twentieth centuries. . . . New emphases on efficiency and productivity stressed numerical measurement as a means of imposing order and predictability on human life and the environment. Scientists, engineers, and corporate managers strove for precision and control through the application of specialization and expertise. These same endeavors were applied to human institutions and activities – schools, medical care, social organizations, and leisure. The impetus for rationality and measurement also included the establishment of orderly categories to facilitate precise understanding and analysis. Age became a prominent criterion in this process of classification. (Chudacoff, 1989, p. 5)

With the employment of a standard starting age, age-batches could be given the same instruction. In France and the United States, organizing instruction into stages for batch-instruction helped administrators supervise teachers (Anderson-Levitt, 1996; Tyack & Tobin, 1994). However, the

bureaucratic employment of age to sort students yielded problems with children who did not fit the developing norms.

Timing and Measuring Development. A growing concern with timing of development stemmed in large part from administrators' concern in the early 1900s with the number of children who were "behind" the grades in school that were designated for them, challenging the bureaucratic efficiency of age-grading (Anderson-Levitt, 1996; Chudacoff, 1989). Psychologists such as E. L. Thorndike and Lightner Witmer began to collect and analyze age/grade data from a number of large U.S. cities, initiating the school-efficiency movement which soon made age/grade tables a routine part of school districts' annual reports (Angus, Mirel, & Vinovskis, 1988).

Calculations of the financial costs of students repeating grades were debated among school and business leaders, and psychologists played leading roles in seeking the causes of "retarded" progress through the grades and in devising systems for "child accounting" (Angus, Mirel, & Vinovskis, 1988).

> The newly emerging profession of psychology saw in the concept of age-grading a measurement tool that could lend scientific legitimacy to their work [and] the same can be said of the emergent field of scientific school administration. [They were] enthralled by statistics and numbers. (p. 223)

However, the standards they set for progress through the grades proved difficult to meet. For example, New York had sparked the concerns about "retardation" by reporting that 39% of students were over-age in 1904, but in 1922, New York's over-age rate was still 31% (Angus, Mirel, & Vinovskis, 1988). Business leaders often criticized the schools' inefficiency, as students took eight or nine years to finish the six elementary grades.

To address the concerns regarding the large proportion of students who were "over-age" for their grade, mental testing developed about this time. The invention of mental testing was based on work in developmental psychology, especially in France and the United States, building on the recent development of laboratory techniques in German psychophysics (e.g., in Wundt's laboratory) and of statistical methods in England (e.g., by Pearson and by Spearman; Fass, 1980). In France, Alfred Binet and colleagues developed tests of mental age as practical tools for schools of the early 1900s to sort out feeble-minded children who needed "special" education.

The intelligence quotient was soon invented to compare tested mental ages to children's chronological ages (by Terman, the Stanford psychologist, in 1916). Americans, particularly, became obsessed with defining and measuring

mental age, creating an American industry that lasted for more than 50 years, and established age norms and developmental schedules (Chudacoff, 1989; Fass, 1980). "Psychologists suddenly found themselves in a lucrative business with skills very much in demand" (Fass, 1980, p. 446).

Contemporary levels of correspondence between age and school grade did not occur until the 1940s or 1950s, with automatic ("social") promotion based on age as a solution to the bureaucratic problem of age/grade discrepancies (Angus, Mirel, & Vinovskis, 1988). This was accompanied by the use of mental testing of various sorts, chronological age, and "ability" grouping to sort individuals for various educational and career opportunities, so that children could be advanced year-by-year according to their ages but sorted into tracks that determined their future instruction and chances.

Many changes in family structure and roles accompanied the shift to mass, compulsory education. Of course, many other features of life changed during industrialization, accompanying the spread of mass, compulsory schooling.

Family Changes Associated with Increases in U.S. Schooling

As children spent more of their days in age-graded schooling, they were less available to help in family economic endeavors. Their economic contributions to the family decreased due to compulsory schooling and child labor laws. With children's increased schooling and decreased economic contributions, children became costly rather than contributors to the family larder or pocketbook (LeVine & White, 1986, 1987).

Family sizes decreased in the period of increasing schooling, in part due to children's changing economic roles (Hernandez, 1994). From 1865 to 1930, smaller families (with only one to four children) grew from 18% to 70%. The median number of siblings in the families of adolescents plummeted from 7.3 to 2.6.[5]

Small family size and school attendance limit the experience children have in caring for younger children (Harkness & Super, 1992; Martini, 1994; Whiting & Edwards, 1988). For example, now that 5- to 10-year-old Kikuyu

[5] Infant mortality dropped over the same period. Around 1800, U.S. women averaged seven live births, of which a third or a half would not survive to five years of age (Ehrenreich & English, 1978). Around 1890, 20% of white children and 40% of black children died before age 15 (Hernandez, 1994). In the 1900s, child mortality in the United States dropped due to improvements in sanitation and nutrition; more recent advances in drugs and immunization have contributed to further drops. By 1973, only 2% of white children and 4% of black children died by age 15.

(Kenyan) children usually attend school, they are no longer available to serve as child nurses for their toddler-aged siblings, although they are the preferred age for this job. This means that Kikuyu mothers now need to rely on children under age 5 to help care for and entertain their toddlers (Edwards & Whiting, 1992).

The age-range of children's interactions with children at home, as well as at school, is thereby restricted. With older children in school, younger children spend less time in their company. In addition, the reductions in number of children tightened the spread of siblings' ages to a narrow range (Chudacoff, 1989). Now that many very young children attend institutional care settings, their days too are increasingly age-graded. Consistent with this segregation, middle-class North Americans emphasize children's peer relations over relations with brothers and sisters (Angelillo, Rogoff, & Morelli, manuscript; Ruffy, 1981; Wolfenstein, 1955).

Now, within nations with near-universal schooling extending throughout childhood, it is difficult to imagine childhood relationships and learning in any other way than that structured by this institution. Looking to other nations where schooling is not so ubiquitous provides important information on distinct ways that childhood can occur when schooling is not such a primary institution as well as information on the role of schooling itself in children's lives. Changes in recent generations in communities where schooling is just now taking hold provide opportunities to consider aspects of childhood that seem to relate to increases in schooling.

Western Schooling's International Spread

The impact of schooling on childhood has grown worldwide in the twentieth century, as Western schooling has spread around the world from its European and North American origins (LeVine & White, 1986). In many parts of the world, Western schooling was initially exported as a means of "civilizing" populations in the colonial eras. The first Western schools in many colonies were introduced as part of the missionizing process (Spring, 1996). Teaching of skills such as literacy was accompanied by insistence on the cultural practices and values of the missionaries, including obedience, punctuality, settled life and private property, and use of a colonial language, in addition to Christianity (Lomawaima, 1994; Spring, 1996).[6] In advice to the British

[6] At the same time, in some settings the colonial powers restricted access to literacy and the colonial language, as a way of dominating subjugated populations.

Parliament in 1847, a well-known educator claimed that the aim of colonial education was to instill Christianity, habits of self-control, and moral discipline, "as the most important agent of civilization for the colored population of the Colonies" (J. P. K. Shuttleworth, quoted by Willinsky, 1998, p. 100).

For example, an "army" of teachers arrived in the Philippines from the United States at the beginning of the 1900s, to instill new attitudes toward wealth and work. The desire for new things, it was thought, would motivate Filipinos to new standards. A domestic science teacher stated, "It is true we are teaching them to want things they have never had or cared to have before; but the incentive to have more will promote the ambition to work" (Cleaves, 1994, p. 7).

Compulsory mass schooling had spread to 80% of countries by 1985, and at least 90% of all children, worldwide, currently spend some time in school (Meyer et al., 1992). Generally, in countries that introduced elementary schooling following the European and American nations, enrollments grew by about 5% per decade from 1870 to 1940, and by about 12% per decade after World War II, accompanying international efforts for all children to attend school (Meyer et al., 1992).

Although secondary schooling has occurred for almost all youth in countries like the United States and Germany for many decades, it has jumped from approximately half of youth in 1980 to about three-fourths in 2000 in Argentina, Egypt, and China. In other nations, the increase has also been dramatic but has started from a much lower baseline, such as in India (moving from a third to a half of youth over this time) and Nigeria (moving from a fifth to a third; Arnett, 2002).

In the next section, we examine changes in schooling over the past 60 years in the Guatemalan Mayan community of San Pedro, as schooling has changed from enrolling only a few children for only a few years, to enrolling almost all children, with some going on to achieve Ph.D., M.D., and law degrees. Schooling had been introduced by Catholic priests from Spain in prior centuries, but it was not until the late twentieth century that this Western institution began to have widespread importance in the daily lives of many indigenous Mayans of San Pedro. We have had the privilege of studying some of the associated changes.

Growth of Schooling in Three Guatemalan Mayan Generations

The role of schooling in the lives of children and families stands out among the rapid changes in recent generations in San Pedro. Our study of these processes

spans three decades, from 1974 to the present, but focuses especially on data gathered in 1976 and in 1999.

In 1976, San Pedro was a town of about 5,000 inhabitants, whose lives were based primarily on traditional subsistence corn-and-beans agriculture, carried out by the men, with handwoven textiles and handmade tortillas made by the women. Travel out of town was on foot, in canoes across Lake Atitlán to neighboring towns, or in motor boats that came to the town dock three times per week. Most people from San Pedro married others from San Pedro, and lived in households in proximity to other kin, as had been the case for several centuries. By 1999, the town had grown to more than 10,000 inhabitants, not counting the many local people who have now emigrated to the capital city, other Guatemalan cities, and some to the US.

Almost all the inhabitants of San Pedro (known as "Pedranos" and "Pedranas" masculine and feminine forms) were and are Mayan Indians. They speak the Mayan language, Tz'utujil, which is unrelated to Spanish – the language employed in national government, commerce in cities, and in schools. During most of the 1900s, schooling was sponsored primarily by the Guatemalan government, expanding on the first San Pedro school, established as a mission school in 1799 (Aguirre, 1972).

To examine changes in involvement in Western schooling, we use data gathered across 23 years on 60 families from San Pedro. The 60 families all had a 9-year-old child in 1976, when Barbara Rogoff did her dissertation study (1977) with them with the assistance of Marta Navichoc Cotuc and several other San Pedro research assistants.

Rogoff has done research in San Pedro over the past 30 years, studying child-rearing practices and participating in the life of the community, living in the town for a total of about two years over the three decades. Navichoc Cotuc joined in the research 28 years ago, and is a native of San Pedro. Rogoff and Navichoc Cotuc repeatedly interviewed and videotaped families, observed children and their siblings and parents, and in the early years gave cognitive tests to the children. Maricela Correa-Chávez joined in the research four years ago, and has conducted interviews and observations over about four months of living in San Pedro. Navichoc Cotuc is a native speaker of the local Mayan language, Tz'utujil; Rogoff speaks and understands it conversationally; Correa-Chávez is studying it. All three speak Spanish, which is used widely as a second language in San Pedro.

Continuing informal contact with the 60 children and families across the decades from 1976 was followed up with formal interviews in 1999 by Rogoff and Navichoc Cotuc. The main interviews in 1976 and 1999 were conducted with adults in the families' homes, in whichever language they were most

comfortable. Some interview information was also obtained from the 9-year-olds in 1976 in a rented room where the children came repeatedly for memory tests, which they regarded as a voluntary school. Our information thus involves interview data collected in 1976 and 1999, regarding

- people who by 1999 were the grandparent generation (*Generation 1* – parents of the 9-year-old children of 1976);
- people who in 1999 were in the parent generation (though some of this generation did not have children; *Generation 2* – they had been 9 years old in 1976); and
- people who in 1999 were the children of Generation 2 (*Generation 3*).

There was considerable mortality of San Pedro children born nine years before the study began in 1976 (35% of that birth cohort had died by age 9, mostly in the first year of life, according to municipal birth records). However, attrition of the sample since then has been minimal, allowing a follow-up that is unusually complete. One of the 60 children who made it to age 9 died of illness as a youth. The remaining 59 were about 33 years old in 1999, and 48 of them still lived in San Pedro. Information was available on all of them, including those who had emigrated.[7]

The 60 children who participated in Rogoff's dissertation study in 1976 were selected from the 9-year-olds of three of the five neighborhoods of San Pedro, and fairly well represented the general population of the town except for the stipulation that they were attending (or had been enrolled in) school.[8] In 1976, about a quarter of the town's 9-year-olds had not attended school. The 60 9-year-old children's level of schooling ranged across four grade levels – about half of them (48%) were in first grade, and most of the rest were either in Castellanización (introduction to Spanish, the language of schooling; 27%) or second grade (22%); two of them (3%) were in third grade. Their average age at school entry was 6.7 years (Rogoff & Lave, 1979); Guatemala's legal public school entry age was 7 years (Irwin et al., 1978).

The ages of the 9-year-olds (average = 9 years, 2 months; range 8 years, 7 months to 10 years, 0 months) were ascertained by municipal birth records in 1976. The parents' estimates of the children's ages often differed from the birth records by a year or two. The parents' estimates of their own ages were based on very rough guesses. Mothers often asked Rogoff to estimate their

[7] Sadly, another of the 60 has died subsequent to the data presented here, murdered by a robber in the capitol city.

[8] Only two families that were approached did not give permission for their children to participate in the study.

own ages, and their own estimates were often in 5- or 10-year increments. Some mothers responded to Rogoff's census question regarding their own age along these lines: "How old am I? Hmmm, well, I don't know. How old would you say, Barbara? Maybe 40? . . . Or maybe more like 50? . . . Put 50."

Schooling Does not Stand Alone

We are not suggesting that schooling is the force behind all the changes in children's lives across generations in San Pedro. Schooling is part of a constellation of changes (Rogoff & Angelillo, 2002), many of which depend on each other. However, we argue that schooling is a key part of the changes and an increasingly important part of children's experience in San Pedro, as in the United States and many other locales worldwide.

Some changes across the generations *can* be attributed directly to changes in schooling. For example, children who spend substantial portions of most days in age-graded schools cannot be involved in care of young siblings during that time. Hence, their child-care responsibilities are diminished; in 1976 needing the children to provide child care was a common reason for nonattendance (on some days, or in some years, or altogether). As another example of a causal link, certain levels of schooling are prerequisite for a number of the occupations that are increasingly commonly held (and aspired to) within San Pedro, such as teacher and accountant. Without schooling, these jobs are off limits.

A number of other changes in San Pedro may also be connected with schooling in a more general fashion, because schooling and other experiences contribute to fluency in Spanish, and this opens up other possibilities for occupations and travel, which in turn encourage greater Spanish fluency. In 1976, Generation 1 males generally spoke some Spanish (73% spoke it "more or less") and females generally spoke none (61%) or a little (25%). By 1999, Generation 2 males usually spoke Spanish well (85%) and females generally did too (68%). In Generation 2 in 1999, 12% of males and 6% of females also spoke some English. At the same time, all individuals in Generations 1, 2, and 3 spoke the Mayan language Tz'utujil – a central marker of Mayan identity.

A number of other forms of communication with the "outside world" have increased dramatically over these years. In 1976, although 87% of the Generation 1 households had electricity supplying at least one light bulb, only 6% had a television. Most households had only a Bible (68%), and the remaining 32% had no books. By 1999, all Generation 1 households had electricity, 78% had a television, 5% had a VCR, and one had a photocopy machine. In 1999, only 23% of Generation 1 households had no books and 38% had only a Bible, while 30% had other books and 8% had shelves of books; 38% of Generation 1 households had a typewriter in 1999 (none had a computer).[9]

In what follows, we examine increases across the three generations in the extent of schooling, accompanied by narrowed age-grading and changes in educational and occupational aspirations, actual occupations, and children's contribution to family work. In addition, increased schooling is accompanied by dramatic decreases in number of children born, yielding limitations in number of siblings. We relate these findings to other research that suggests that with increases in schooling, mothers also appear to be more likely to interact with their children in ways that resemble the formats of schooling and less often to engage in the sort of collaborative group endeavors that seem to characterize traditional indigenous family and community organization (Chavajay & Rogoff, 2002; Rogoff, Mistry, Göncü, & Mosier, 1993).

Increases in Involvement in Schooling

From Generation 1 to Generation 2, a dramatic shift occurred from almost no schooling for most children, to considerable numbers of youth achieving higher degrees. In both generations, the extent of schooling was less for girls than for boys (see Table 9.1).

The prevalence of schooling is quite related to the level of schooling that has been available locally for the different generations. In 1936, third grade was the highest grade available locally, and school comprised only a few children (mostly boys) of varying ages, who generally attended for only a year (Chavajay & Rogoff, 2002). By 1953, the top grade extended to sixth grade (Demarest & Paul, 1981). Still for years, many did not attend school, a third-grade education was common, and graduation from sixth grade was a

[9] When adult Generation 2 households lived apart from Generation 1 households, the patterns were similar to those described here, although Generation 2's households were a little more austere than their parents' households. One third of married Generation 2 individuals lived in households combined with their parents' households. Unmarried Generation 2 individuals lived in their parents' household if they lived in San Pedro. (Of 8 unmarried individuals, 4 lived in San Pedro.) Of the 34 Generation 2 married households that were separate from Generation 1 households, 27 lived with the other spouse's parents or in a separate household in San Pedro, and 7 lived in another town or city.

considerable accomplishment. In 1972, grades 7–9 became available and in 1995, a teacher-training school encompassing grades 10–12 opened.

In the Yucatán, in communities with primarily Mayan background, the most powerful predictor of how many grades an individual would attend was the number of grades available in the individual's town (during roughly the same era as our Generation 1; Sharp, Cole, & Lave, 1979). Few individuals attained more schooling than that available in their town. The number of grades available in town served as a ceiling, and people reported aspirations set at about 70% of the highest amount of schooling available in their towns. (Maternal schooling was also a strong predictor of individuals' schooling in the path analysis reported by Sharp and colleagues.)

Few of San Pedro's Generation 1 received more schooling than was available locally. Many had no schooling at all (67% of the females and 33% of the males), and the majority had two or fewer grades of schooling (including those with no schooling: 87% of the females and 63% of the males). Almost none had completed more than six grades, with the exception of two who completed career studies equivalent to 12 grades.

By Generation 2, much more schooling was available in San Pedro. However, some children enrolled in 7th through 9th grades in distant cities, even though these grades had become available in San Pedro; their families believed they would thereby get a better education. In addition, a number of Pedranos and Pedranas pursued more schooling than the highest grade level available in town. Families could better afford the added expenses of studying out of town than in the previous generation (about half of the students attending 7th through 9th grades in 1976 studied in distant cities; Rogoff & Lave, 1979).

In Generation 2, the extent of schooling was much higher than in Generation 1, as can be seen in Table 9.1. All children had some schooling – a selection criterion for being in the study.[10] About half of Generation 2 completed one to six grades (61% of the females and 44% of the males), another 7%–10% completed seven to nine grades, and 30% of the females and 48% of the males completed the 12 grades required for entry into careers such as teacher and accountant (and one of the males had a higher degree). The level of schooling achieved by Generation 2 children was not

[10] This selection criterion may have meant that their parents – Generation 1 – had more schooling than average for the town; the 25% of children who were not in school in 1976 may have had parents who had attended less school than the Generation 1 parents. However, data from a random sample of 239 households carried out in 1974 show similar levels of parental schooling as the present data.

Table 9.1. *Extent of Schooling in Generations 1 and 2*

	Generation 1		Generation 2	
Highest Schooling	60 Females	60 Males	30 Females	29 Males
0	40 (67%)	20 (33%)	0	0
1–2	12 (20%)	18 (30%)	5 (17%)	5 (17%)
3–4	6 (10%)	17 (28%)	8 (27%)	3 (10%)
5–6	1 (2%)	4 (7%)	5 (17%)	5 (17%)
Básico (7–9)	0	0	3 (10%)	2 (7%)
Career (12+)	1 (2%)	1 (2%)	9 (30%)	14 (48%)

significantly correlated with their mothers' or their fathers' limited level of schooling.[11]

Greater Level of Schooling than Neighboring Mayan Towns

San Pedro's rate of schooling is considerably greater than in the neighboring Tz'utujil Mayan towns. In 1962, 40% of children were enrolled in San Pedro's school, a proportion much higher than in the larger Tz'utujil town of Santiago Atitlán, only a few miles away (Paul, 1968). Moreover, in Santiago Atitlán, the rate of schooling did not increase between 1964 and 1990. Across these decades in the neighboring town, a steadily high rate of attrition prevailed: Compared with the number of children in first grade, there were 38%–47% fewer children in second grade and 78%–89% fewer in sixth grade (Carlsen, 1997). By comparison, in the San Pedro Generation 2 data, for schooling during the same era, just 17% of the children attended only one to two grades, and over half of the children completed six grades or more.

In two other Tz'utujil towns a short walk from San Pedro along the lakeshore – San Juan and San Pablo – schooling was also less prevalent than in San Pedro. Although children are required by Guatemalan law to attend school from age 7 to 14, only 67% in San Juan and 18% in San Pablo were enrolled in 1978, and those usually attended primary school irregularly and seldom remained in school after age 10 or 11 (Loucky, 1988). When they were needed at home, their work took priority over schooling, which

[11] Moreover, for the most part, as young adults, both Generation 1 and Generation 2 individuals seemed to have married without much consideration of schooling level; their spouses' level of schooling was not correlated with their own. The exception was that Generation 2 women who had six or more grades of schooling almost all married men with similar extent of schooling.

was not expected to be of much use. By age 7, children were becoming dependable for many significant subsistence tasks, and apparently were more heavily involved in them in the two neighboring towns than in San Pedro, where schooling had taken a greater hold.

The variability in uptake of Western schooling in these Tz'utujil Mayan towns underlines the importance of not assuming uniformity across even closely related communities. San Pedro is known among Indian towns in this region for its interest in schooling.

San Pedro's emphasis on schooling can be seen in its teachers and other professionals. In 1936 the one teacher in town was non-Mayan (Chavajay & Rogoff, 2002), and still in 1976 most teachers in San Pedro were non-Indians from elsewhere in Guatemala. However, by the late 1990s most San Pedro teachers were Pedranos or Pedranas. In 1997, 114 of the 130 teachers employed in San Pedro were natives of San Pedro (12 were from other Mayan communities and 4 were not Mayan; Chavajay & Rogoff, 2002). In fact, San Pedro has been supplying a high proportion of teachers for the state as a whole (including staffing schools in Santiago Atitlán, San Juan, and San Pablo). A 1994 estimate indicated that San Pedro likely contributed more teachers working in the whole state of Sololá than all 18 of the state's other municipalities combined (Paul, 1994). In addition, in the late 1990s, about 100 students from San Pedro were attending universities (Chavajay & Rogoff, 2002) and about a dozen Pedranos and Pedranas had received or were studying for medical, law, or Ph.D. degrees.

Narrowed Age-Grading Accompanying Increased Schooling

In 1999, we asked about the schooling of the child of the Generation 2 individuals who was the closest in age to 9 years and the same gender if possible (Generation 3). Of the 59 surviving Generation 2 individuals, 27 had a child aged 6 to 14 years (average age was 8.8 years).

Generation 3 children were all in school, and their current grades closely matched those expected by their ages in an age-graded system. Most of the children (16 of 27) were in the expected grade, and almost all the rest were in the grade above (3) or below (5) the grade associated with their age – variation which would often be the case in strictly age-graded schools due to differing birthdates throughout the year. Only 3 of the 27 Generation 3 children were in a grade that was more than one grade different than the expected grade for their age (all 3 were two grades below). This is a narrower age range per grade than when Generation 3's parents were 9 years old.

The wide spread of ages within grades in the generation corresponding to Generation 2 was clearly apparent in a nearly random sample of 126 San

Pedro children aged 6 to 13, censused in 1974 by Rogoff. Only a few of the 6-year-olds and half of the 7-year-olds had entered school. At ages 8 and 9, 77% of the children had enrolled in school (ranging from Castellanización to second grade), and at ages 10 to 13, 88% of the children had some schooling, although 12% of the 10- to 13-year-olds had already quit school. There was a 6-year range within each of the first three grade levels (with children of ages 6–11 years in the preliminary "Castellanización" class, to learn Spanish to enter first grade, also 6 to 11 years in first grade, and 8 to 13 years in second grade). From third to sixth grades, the youngest ages crept up (11, 10, 11, and 13 years), but we cannot determine the oldest age because the top age examined was 13. However, the 10–11-year-olds who were still in school ranged from Castellanización to fifth grade and the 12–13-year-olds who were still in school ranged from second to sixth grades.[12]

It appears that in the time between the childhoods of Generation 2 and 3 (the 1970s and 1990s), schooling in San Pedro had become fairly tightly age-graded. Before that, children started at different ages and attended less continuously (across days and across years). Many of the Generation 2 children also struggled more to learn Spanish (because Spanish was used less in homes and in the community overall). Because speaking Spanish was a prerequisite for entry to first grade, which was taught solely in Spanish, more variation in this skill probably contributed to the wide spread of ages in each grade.

Aspirations for Schooling Rise Too

Children's aspirations regarding how far they would go in school rose dramatically across Generations 2 and 3 (see Table 9.2). Those who were 9 years old in 1976 (Generation 2) were asked how far they expected to go in school ("What grade do you think you'll go to?"). In 1999, the same question was asked of the Generation 3 children.

[12] In San Marcos, a few miles away, children (and teachers) attended school sporadically in 1980; on average children missed about half of the school time, due in large part to needs for their help at home and little confidence that school served a useful purpose. About half of the children enrolled in Castellanización and primary school were repeating the grade that they were in – for the second, third, fourth, or fifth time (Richards, 1987). In Castellanización (introduction to Spanish), only 2 of the 32 children who were not repeating this grade ended up passing into first grade, and of the 30 children who were already repeating this grade, only half ended up passing it.

Table 9.2. *Highest Grade Children Expect to Complete, in Generations 2 and 3*

	Generation 2		Generation 3	
	30 Females	30 Males	13 Females	14 Males
Don't know	0	3 (10%)	2 (15%)	0
0–2	8 (27%)	5 (17%)	0	0
3–4	7 (23%)	11 (37%)	0	0
5–6	14 (47%)	9 (30%)	1 (8%)	4 (29%)
Básico (7–9)	1 (3%)	2 (7%)	3 (23%)	3 (21%)
Career (12+)	0	0	7 (54%)	7 (50%)

Almost all (95%) Generation 2 children had aspired to six or fewer grades when they were 9 years old (although many of them in fact went on to complete many more grades). In contrast, fully half of Generation 3 children aspired to complete at least 12 years of schooling. The change in aspirations could be based on the increased availability of schooling locally, the dramatically greater levels of schooling of their own parents, the improved economic circumstances across decades for many families, and other cohort differences supporting increased levels of schooling. It could also be that the Generation 3 children are predicting their schooling more accurately, based on more information about what is available (due to more schooling being available in town and more information about schooling available via television and other media by 1999).

The Generation 2 children's schooling aspirations correlated positively with their mothers' level of schooling ($r = .30$, $p = .01$). This effect seems to have come from the Generation 2 girls ($r = .44$, $p = .008$); the correlation for boys did not approach significance ($r = .06$). (There was no correlation with fathers' level of schooling.) Surprisingly, Generation 3 children's schooling aspirations were not correlated with their mothers' or fathers' levels of schooling. Perhaps Generation 2 girls were more likely to be encouraged in their schooling if their mothers had any schooling, and by Generation 3, the potentials of schooling in people's lives were more visible (in town and on television), providing more wide-based encouragement to go on in school.

Aspirations for Adult Occupation Transform with the Generations

The children in Generations 2 and 3 were asked (in 1976 and 1999) what work they expected to do when they grew up ("What work do you think you might do when you grow up?"). The children's aspirations in Generation 2

Table 9.3. *Children's Anticipated Occupations, in Generations 2 and 3*

	Generation 2		Generation 3	
Anticipated Occupation (as child)	30 Females	30 Males	13 Females	14 Males
Weave, embroider*	13 (43%)		2 (15%)	
Make tortillas, cook	12 (40%)		2 (15%)	
Wash, sweep up	5 (17%)			
Farming, cultivation		23 (77%)		3 (22%)
Gather firewood		5 (17%)		1 (7%)
Become mayor		1 (3%)		
Teacher			2 (15%)	2 (14%)
Accountant, secretary			3 (23%)	1 (7%)
Student (higher education)		1 (3%)	3 (23%)	
Doctor, lawyer				2 (14%)
Pastor				2 (14%)
Carpenter				2 (14%)
Musician				1 (7%)
Don't know			1 (8%)	

* Girls who expected to weave or embroider often also mentioned making tortillas and cooking.

(1976) resembled the kind of work that they were already doing to help in their family and the kind of work their same-sex parent did (see Table 9.3). Girls anticipated weaving, embroidering, making tortillas, and washing clothes and dishes. Boys anticipated farming and gathering firewood. Most of these children could anticipate that as adults they would continue to participate in extended household production and work on family land. The only Generation 2 children who fell outside this pattern were a boy who expected to go on to higher education and a boy who anticipated becoming mayor.

By Generation 3 (1999), few children had aspirations resembling those of Generation 2 as children. (Only 30% of the girls and 27% of the boys had aspirations like their Generation 2 parents had as children.) Most of the others aspired to go on in their studies and work in specialized careers such as teacher, accountant, pastor, and doctor.[13]

[13] Of the 5 Generation 3 children whose same-sex parent had a career requiring extensive schooling, all wanted such careers themselves. In addition, 1 girl whose mother had a little store wanted to become an accountant, 4 girls wanted to weave or work at home like their mothers, and 3 boys wanted to become a musician, a carpenter, or to work the fields like their fathers. The other children's occupational aspirations did not seem related to those of their same-sex parent (and relations with the other-sex parent's occupation seemed minimal).

Table 9.4. *Adult Occupations of Generations 1 and 2*

	Generation 1		Generation 2	
Adult Occupation	29 Females	30 Males	30 Females	29 Males
Weave, embroider*	19 (63%)		15 (50%)	
Make tortillas, cook	6 (20%)		5 (17%)	
Midwife	1 (3%)			
Farming, cultivation		27 (90%)		6 (21%)
Market/store sales	3 (10%)	3 (10%)	3 (10%)	3 (10%)
Teacher			3 (10%)	5 (17%)
Accountant, manager, sec'ty			3 (10%)	2 (7%)
Student (higher education)			1 (3%)	
Doctor				1 (3%)
Pastor				1 (3%)
Carpenter, tailor, shoemaker				4 (14%)
Factory worker				3 (10%)
Truck driver				2 (7%)
Security guard				1 (3%)
Musician				1 (3%)

* Women who identified their work as weaving or embroidering often also mentioned making tortillas and cooking.

Adult Occupations Move from Agricultural and Home Production to Include Teaching and Other New Positions

To compare the actual adult occupations of Generation 1 and 2, we examined occupations of the same-sex parent of each of the Generation 2 individuals (see Table 9.4). Many of the Generation 2 females followed the same occupations as their mothers, with the addition of paid careers for about a fourth of them. The Generation 2 males, however, shifted markedly from their fathers' occupations – only a third of them followed the occupations of their fathers, and the other two thirds followed new careers.

Many of the new occupations have high schooling prerequisites, requiring completion of 12 grades to qualify for them. All of the Generation 2 individuals who are in the professions of teacher, accountant, manager, secretary, doctor, pastor, or still studying have completed twelve or more grades. This comprises 7 (23%) of the females and 9 (31%) of the males (and none of their parent generation). The other Generation 2 individuals who have completed 12 or more grades are in the following occupations: 2 females work at home cooking; 2 males work in sales, 2 in factories, and 1 in carpentry. The other levels of schooling seem to be spread randomly among the other kinds of work (both traditional and new) that do not require completion of 12 grades, for the rest of the Generation 2 females and males.

Some of the pressure to adopt wage-earning occupations may come from the decreasing landholdings available to each generation across the 20th century. Guatemala has the most extreme discrepancy between landholdings of the wealthy and the poor in Latin America: In about 1980, 1% of the population controlled 66% of the land, whereas 96% of the population controlled only 16% of agricultural land (Early, 1982, as cited by Loucky, 1988). This imbalance is exacerbated by the rapid increase in population, such that already-small plots of land are subdivided into plots too small to sustain a family. In 1979, 77% of rural Guatemalan households had insufficient holdings for subsistence (Early, 1982, as cited by Loucky, 1988). The population of San Pedro has grown from about 2,000 in 1941 to over 12,000 in 2002, despite a great deal of outmigration to cities, where there are often not sufficient jobs to support them.

Extensive schooling does not guarantee a good job. A number of Pedranos and Pedranas employed as teachers as of 1994 had jobs in private schools with poor remuneration, in hopes of moving into a well-paying government teaching position, and about 25% of those who were trained as teachers were not employed as teachers (Paul, 1994). About a third of these had other positions in office jobs in the capital or were doing well as agriculturalists; however, the others worked in trades in San Pedro or in available jobs in the capital. Some of these may be represented among the Generation 2 individuals who have more than 12 years of schooling but are working in homemaking, sales, factory work, and carpentry, which do not require such high levels of schooling.

Possible Generational Changes in Schooling's Relation with Occupations

Going to school may provide different occupational benefits for Generations 1, 2, and 3, associated with the dramatic differences in prevailing levels of schooling as well as available occupations. For Generation 1, who completed just a few grades, learning Spanish – useful in commerce – may have been a primary effect of school attendance. Primary schooling may have provided skills used in transitioning from agriculture and home-based production to merchant and traveling roles. In prior generations, the value of schooling for agricultural careers was questioned by San Pedro parents. For Generation 2, credentialing needed for salaried professions may commonly be the effect of completing 12 grades of schooling. With secondary schooling, Pedranos and Pedranas may join the bureaucratic workforce.

Consistent with these speculations, a path analysis indicated that for Generation 1, Spanish fluency was more closely related than schooling to adult income and family wealth (Rogoff & Lave, 1979). (Generation 1's Spanish fluency was itself predicted by extent of schooling and contact with Spanish speakers in the course of work and everyday life.) However, Generation 1 men's involvement in nonagricultural careers (such as teaching, tailoring, and ministry) was predicted by their level of schooling, perhaps due to credentialing barriers in many such occupations or perhaps due to a need for higher levels of literacy in some of them. Generation 1's Spanish fluency was also more related than was their schooling to the extent of schooling of their Generation 2 offspring, but family wealth, fathers having nonagricultural careers, and mothers' contact with non-Pedranos were even more directly related to Generation 2's schooling. By the time the available level of schooling included secondary school (as was the case for Generation 2), the credentialing effect may have been much stronger in relating extent of schooling to other aspects of San Pedro lives.

The reasons that Generation 2 and 3 children gave for attending school were also consistent with the idea of changing benefits of schooling. Many Generation 2 children (47% of them) said that learning Spanish was their reason for going to school, whereas only 15% of Generation 3 children gave this reason. Between 1976 and 1999, the general usage of Spanish has increased greatly, so it may be more taken for granted, and also easier to learn because of the greater prevalence of Spanish on television, in local tourism, and in everyday local use (in addition to the increase in schooling and the advent of bilingual Mayan–Spanish early schooling). Generation 3 children's reasons for attending school included being students in order to get a good job, cited by 37% of them and none of the Generation 2 children. (The remaining children in both generations reported that they went to school to learn to read and/or write, or did not have a reason.)

Children's Work Contributions Decline

The increases in children's schooling across the generations have been accompanied by decreases in their contributions to family work. With increasing days and years spent in school and with decreasing numbers of siblings, fewer boys were involved in caring for siblings, but most girls still had some child-care responsibilities. (See Table 9.5.) However, the amount of time spent in child care is probably much less for both girls and boys (based on casual observation of frequency of seeing a child tending a baby, and commentary of San Pedro parents; Magarian, 1999).

Table 9.5. *Number of Children Doing Each Type of Work (as Reported by Parents)*

	Generation 2		Generation 3	
Type of Work	30 Girls	30 Boys	13 Girls	14 Boys
Tending a baby	18 (60%)	16 (53%)	8 (62%)	1 (7%)
Weaving	26 (87%)		0	
Washing clothes	21 (70%)		8 (57%)	
Making tortillas	12 (40%)		4 (29%)	
Selling (store or street)	5 (17%)	1 (3%)	0	0
Cleaning houses for pay		1 (3%)		
Farming/cultivation	1 (3%)	17 (57%)	1 (7%)	5 (36%)
Fishing		6 (20%)		3 (21%)
Picking coffee	0	0	2 (14%)	9 (64%)

Children also participate less in other family work. For example, no girls of Generation 3 are involved in weaving, whereas 87% of their mothers (at age 9) had been weaving or beginning to weave – a primary job of San Pedro women of prior generations. (Half of the Generation 2 girls who were involved in weaving were at the level of play-weaving, in which girls set up little looms using found materials and practice weaving.) There also seems to be a slight decrease in children's washing, making tortillas, and selling (peddling or helping in a family shop).

Somewhat fewer boys of Generation 3 than Generation 2 are involved in tending family corn, bean, onion, and fruit crops – formerly the main male occupation. However, in 1999, the children – especially boys – picked coffee beans on family trees or for pay (for Pedranos with larger landholdings), accompanying the increase of this cash crop since their parents were children.

There are also differences in the number of types of work each child does (using the types listed in Table 9.5; see Table 9.6). In Generation 3, a higher proportion of the children are reported not to be doing work at all, which was less common in Generation 2, χ-square $= 8.02$, $p < .009$. (In both generations, boys are more often the ones doing no work.)

The average number of different types of work done by the children has decreased from Generation 2 to Generation 3, $t\ (85) = 3.00$, $p = .003$. The change is mostly among the girls: Generation 2 girls averaged 3 types of work, whereas Generation 3 girls averaged only 1.7 types of work. The boys' number of types of work changed little, averaging 1.5 and 1.3 types of work in Generations 2 and 3.

These changes are consistent with LeVine and White's (1987) contrast of children's roles in agrarian communities versus in middle-class communities

Table 9.6. *Number of Types of Work by Children in Generations 2 and 3*

No. of Types of Work	Generation 2		Generation 3	
	30 Girls	30 Boys	13 Girls	14 Boys
0	0	3 (10%)	2 (15%)	5 (36%)
1	1 (3%)	12 (40%)	3 (23%)	3 (21%)
2	9 (30%)	12 (40%)	6 (46%)	3 (21%)
3	9 (30%)	3 (10%)	1 (8%)	3 (21%)
4	10 (33%)		1 (8%)	
5	1 (3%)			
Average	3.0	1.5	1.7	1.3

in industrialized nations, where parents provide economic and social support to children without expecting tangible returns. Middle-class occupations result in many children needing to make their future careers in work that their parents do not know how to do, in contrast with agrarian traditions. Thus, childhood becomes a time of preparation for uncertain employment in adulthood, instead of ongoing involvement in family and community productive activities (Rogoff et al., 2003).[14]

In prior generations, children in San Pedro contributed importantly to the resources of their family; such contributions were also noted in work done in 1978 in the nearby Tz'utujil towns of San Juan and San Pablo (Loucky, 1988). "Maya children represent positive net economic value by adolescence. This contributes to continuing upward pressure on fertility and school abstention" (p. xi).

Fertility and Infant Mortality Decline, and with Them, Number of Siblings

Generation 1 parents had a relatively large number of children, several of whom usually died in early childhood. We compare Generation 1 and 2 childbearing at the age of 33, in order to hold constant the number of years available to bear children. We also limit the comparison to the Generation 1 parent that is of the same gender as the individuals included in Generation 2 ("same-sex Generation 1").

By the time the same-sex Generation 1 individuals were an estimated 33 years old, in about 1968, they had had an average of 6 children (see Table 9.7). Of course, many continued to have children after age 33; females

[14] The number of chores that the Generation 2 children did was not significantly correlated with the limited amount of schooling of their mothers or their fathers.

Table 9.7. *Fertility and Child Mortality of Same-Sex Generation 1 and 2 Parents*

	Same-Sex Generation 1		Generation 2	
	30 Females	29 Males	30 Females	29 Males
Average # children born by age 33	6.6	5.5	2.4	2.0
Range	3–15	3–9	0–7	0–6
# with no children at 33	0	0	4 (13%)	5 (17%)
# with 1–2 children	0	0	15 (50%)	16 (55%)
# with 3 or more	30 (100%)	29 (100%)	11 (37%)	8 (28%)
Ave. # babies died by 3 years across childbearing	1.9	1.7	0.3	0.1
Range	0–13	0–7	0–3	0–2
# w/ no babies that died	4	8	23	26
Ave.# died age 3–18*	0.2	0.7	0*	0.04

* *Note:* Generation 2 had less opportunity for older children to die, as Generation 2 was only 33 at the time of data collection.

averaged 8.4 live births (range 3 to 18) across their childbearing years. Across their childbearing years, they reported that about 2 of their children died.[15,16] Generation 1 males, marrying a couple of years older, had had a smaller average number of children born by age 33, but they caught up (Generation 2 males' fathers' total number of children born was 9.1; range 3 to 16).

When Generation 2 was 33 years old, in 1999, they had an average of 2 children per family and only an average of 0.2 had died. It is striking that about two thirds of Generation 2 had 0 to 2 children by age 33, whereas none of their same-sex parents (in Generation 1) had this few children at age 33.[17] It

[15] It seems that the mothers reported fewer mortalities than those documented in the municipal death records; probably they did not report the deaths of some babies who died in the first days or weeks of life. This may make sense given high birth and mortality rates, in retrospective reporting across several decades.

[16] These fertility figures are similar to those of neighboring Santiago Atitlán, where the average mother had eight live births in the mid-1960s (according to Early's data, reported by Carlsen, 1997). The rate of infant and child mortality, although high, is perhaps less than in prior decades. In Santiago Atitlán in 1950, more than 50% of children died between ages 0 and 4; by the mid-1980s, half of the women of Santiago Atitlán reported losing no children (Carlsen, 1997). In nearby towns of San Juan and San Pablo, about a fifth of children were reported to have died, according to 1978 information that resembles figures in San Pedro (Loucky, 1988).

[17] Of course, the parents are not a random sample of people of their generation; they were selected on the basis of having a 9-year-old in 1976, so all had

is also striking that during their childbearing years, almost all of Generation 1 had at least one child die, and usually 2, whereas at age 33, almost all of Generation 2 had lost no children.

Generation 1 women as a whole (all 60 of them, mothers of both Generation 2 females and males) had slightly fewer children born the more years they completed in school ($r = -.20$, $p = .06$). However, the relation between the Generation 1 men's extent of schooling and their number of children did not approach significance ($r = -.12$). Generation 2 individuals, at age 33, had significantly fewer children born the further they went in school, $r = -.31$, $p = .009$. [The correlation was about the same for Generation 2 females ($r = -.27$) and for Generation 2 males ($r = -.31$).]

The generational changes in fertility and mortality mean that the family experiences of Generation 3 are far different than those of Generation 2. Only about a third of Generation 3 children have more than 1 sibling, whereas all of the Generation 2 children had several siblings. Half of the Generation 3 children have one or no siblings, and Generation 3 children do not exist at all for 9 of the Generation 2 individuals who are childless.

So across the generations, we see large increases in schooling, in age-grading, and in aspirations for schooling and school-based occupations (as well as greater involvement in school-based occupations); this is accompanied by children's lesser involvement in sibling care and other contributions to their households, and fewer siblings to engage with. San Pedro children have become more unique in their families and more segregated from household and community activities as they spend increasing time in schools, in preparation for work that differs from that of their parents and grandparents. The changes seem to be transforming childhood from being a contributing segment of family and community worlds to being segregated and preparing to contribute to bureaucratic organizations that pay salaries (if they are fortunate to be both successful in school and in competing for the limited posts available).[18]

at least one surviving child by the design of the study. Nonetheless, the differences between generations in the same families are notable.

[18] Schooling in many systems is designed to fail some proportion of students, many of whom approach their subsequent lives as failures, unlike in generations where schooling was not an option (see Serpell, 1993). The unavailability of jobs for which students have prepared also means that a number of successful students become unsuccessful in the job market. The consequences of failed aspirations (for the individual, family, and community) are worthy of study, especially as the school/work system that children enter in "developing" and post-industrial societies is often designed for a

More School-Like Adult–Child Interactions

With greater experience of school and fewer children, more of whom were likely to survive, other studies have shown that San Pedro mothers were more likely to interact with their children in ways that were similar to those of middle-class European-American mothers. With their toddlers, they gave language lessons, acted as peers in conversation and play, and used mock excitement and praise to motivate involvement in their own agenda (Rogoff et al., 1993). With older children, highly schooled San Pedro mothers took a more managerial role and divided a task among themselves and three children, rather than approaching it as a collaborative group (Chavajay & Rogoff, 2002). In families with little or no involvement in schooling, there was greater use of interactional patterns that appear consistent with traditional indigenous social organization – keen observation, supportive assistance, and fluid coordination in groups engaged in shared endeavors (Chavajay & Rogoff, 2002; Rogoff et al., 1993). (Maternal experience in school has also been found to relate to mother–child interaction in a number of other communities around the world; Laosa, 1980; Mejía Arauz et al., in preparation; von der Lippe, 1999.)

In related findings from Cuernavaca, México, mothers who had 6 to 9 years of schooling were more likely to desire and give birth to a smaller number of children, as well as to discuss family planning with their husband, compared with mothers who had 1 to 5 years of schooling (LeVine, LeVine, Richman, Tapia Uribe, Correa, & Miller, 1991; Miller, 1997). The more-schooled mothers were more likely to respond to their infants' vocalizations and looks with vocalizations, perhaps modeling after school experiences. LeVine et al. (1991) summed up their view of the role of schooling as follows:

> As schooling becomes institutionalized, mothers who have acquired this model in the classroom increasingly prepare their children for school, engaging them in pedagogical interaction at younger and younger ages. This means verbal responsiveness to the child during infancy, which has the effect of producing a verbally active toddler who frequently initiates demands for maternal attention during the post-infancy years. Such children are on the average less compliant and more "difficult" and "exhausting" to raise, reinforcing the mother's assumption that child care is a labor-intensive task – requiring more of her time and energy

considerable proportion to fail – a striking contrast with lives a few generations back where almost everyone had work and made valued contributions in the community.

than it did for her own mother (prior to female schooling in an agrarian community) and inducing her to bear fewer children. (p. 486)

A Moment in Time?

The observations of changes accompanying schooling in San Pedro complement the historical analysis of the role of widespread schooling in the lives of U.S. children. With extensive involvement in Western schooling, children's lives seem increasingly to involve segregation from adults and association with close-in-age peers and siblings, accompanying smaller family size, decreased infant mortality, and reduced contributions by children to sibling care and other family work. When schooled children grow up, they seem to adopt some of the ways of schooling in dealing with their own children – such as attempting to manage children's attention and learning, employing more managerial roles, and less side-by-side pitching in together on a common productive endeavor.

At the turn of the twenty-first century, in middle-class communities in the United States, and increasingly in other communities around the world such as in the Mayan town of San Pedro, schooling seems to have become sufficiently obligatory and widespread that it is becoming "naturalized" in people's thinking about childhood. People often assume that the conditions of childhood surrounding schooling are simply the way children and families "are." Our aim is to call attention to them as a rather unique historical/cultural phenomenon that has wide and deep consequences for children's everyday lives as well as those of their families of origin and their subsequent families when they grow up.

LeVine and White (1987) have pointed out that the similarities across societies in the conditions of childhood accompanying compulsory and extensive schooling – such as small family size, low infant mortality, and limited economic contributions from children – stem from very different histories. The histories vary among different European and American nations, as they do among different neighboring Tz'utujil Mayan towns. In particular societies, these developments relate to industrialization, urbanization, and local childrearing philosophies in different manners and distinct sequences across the last few centuries. Despite the differing origins and routes, compulsory schooling has become a ubiquitous aspect of childhood, along with its accompanying features such as small family size, reduced infant mortality, reduced child contributions to family and community, and increased age segregation.

The historical changes leading to the present do not end in this moment. New generations will face changed circumstances and will develop new approaches that resemble current forms of childrearing in some ways and depart from them in others, reflecting distinct cultural histories as well as local and global change.

Despite its current ubiquity, compulsory, extensive mass schooling itself is a short experiment. Even during its century of existence in the United States, a number of transformations in its purposes and formats can be seen (along with some sturdy continuities, such as age-grading and standardized "measures" of students).

Although developmental researchers often treat schooling as a "natural" part of child development, as Diana Slaughter-Defoe has pointed out (in a planning meeting on child development and learning at NSF; July 1998), there is reason to question whether schooling will continue to play the same role throughout the coming century.[19] She posed the question, if schools are likely to cease to exist in 75 years, how should developmental researchers and policymakers currently be conceptualizing and contributing to the design of arrangements for children's learning and development? We regard this thought experiment as extremely valuable for broadening the perspective on how future practices and institutions can be designed to support children's development for the circumstances of the future.

Investigating the arrangements for children's learning in settings where Western schooling has not been prevalent for generations provides key information for considering resources for aiding children's learning. Such research not only helps us understand the role of Western schooling in children's lives in societies where this institution is central to children's lives, but also draws attention to the ways that children learn in communities where schooling is not pervasive. In many such settings, children learn by keen observation in the process of being involved in their communities' activities with people of a wide age range, motivated by the importance of the activities and the value of their contributions (Rogoff et al., 2003).

In commenting on the reduction in children's opportunities to engage in shared endeavors with adults, working side-by-side to accomplish a joint task together, Heath pointed out the importance of such situations for child and

[19] Her speculation was based in part on increasing use of home schooling, private schooling, and opportunities for other forms of learning (such as distance learning and use of the internet as an learning resource).

youth development:

> Currently, aside from agricultural households, relatively few [U.S.] families spend time in cross-age tasks that require planning, practice, and productive work across a period of several weeks or months. Yet these are the very situations in which children are most likely to engage in work on tasks beneficial to them and others and to receive extensive authentic practice [in] planning ahead, linking current actions to future outcomes, and self-assessing and self-correcting their own behaviors and attitudes. (1998, p. 217)

Such involvement is an important feature of a number of voluntary community youth organizations such as drama, arts, sports, and service clubs. In such settings, young people often learn and demonstrate important planning, hypothetical thinking, language, and leadership skills (supported by adult mentors and coaches) that they frequently do not show in schools (Heath, 1998).

Of course, schooling does not necessarily need to segregate children from the adult world or from making contributions to their communities (Bronfenbrenner, 1974). Efforts to improve the formats of schooling can be informed by greater understanding of the roles of schooling and of changing community structures in children's lives. Indeed, some innovative schools employ processes of intent participation that have long characterized children's contributions to their family and community lives in communities in which schooling has not been a central activity of childhood (Rogoff, Goodman Turkanis, & Bartlett, 2001; Rogoff et al., 2003).

As Shep White (1999) has eloquently pointed out, it is part of the role of developmental psychology to contribute to the design of societies' institutions for children. To do so most effectively requires some understanding of the powerful roles and the diverse trajectories of institutions such as schooling and family and work organization in children's lives across time and place.

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