CHAPTER 3

Social Change and Human Development

An Autobiographical Journey

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Abstract

This chapter reviews research on social change and human development that has culminated in the author's Theory of Social Change and Human Development. At the heart of the theory is the notion that sociodemographic factors drive cultural values, learning environments, and, ultimately, developmental trajectories. Changing sociodemographic conditions transform these values, environments, and pathways. The author's research in Senegal, Mexico, the United States, and Italy demonstrates that the dominant direction of global social change—from subsistence to commerce, village to city, informal education at home to formal education at school, and low technology to high technology—results in more individualistic values, greater independence from family, more innovative thinking, and more abstract cognition. The theory has applicability to social change within a country and among migrants who change countries and to both basic and applied research.

Keywords: Social Change; Human Development; Gemeinschaft; Gesellschaft; Migration; Urbanization; Technology; Formal Education; Learning Environment; Socialization; Cultural Values

I. INTRODUCTION

The subject of social change and human development has been a linking thread in my entire career in cultural and cross-cultural psychology. Recently, this journey has culminated in a Theory of Social Change and Human Development. The theory was directly inspired by 35 years of work in Chiapas, Mexico but,

in fact, ties all strands of my cultural and cross-cultural research together and is generating new research around the world. To give the reader a sense of these links, I will describe the theory and then move chronologically through the research, beginning with its intellectual origins. Along the way, I will chronicle my related scholarship, ending with real-world applications and future directions.

II. A THEORY OF SOCIAL CHANGE AND HUMAN DEVELOPMENT

The goal of my Theory of Social Change and Human Development is to show how changing sociodemographic environments—the concatenation of ecology, economy, and normative social relations—alter cultural values and learning environments, thereby shifting developmental pathways (Greenfield, 2009a). The theory, therefore, deals simultaneously with two scales of development: change within a lifetime and change across succeeding generations.

In the field of developmental psychology, one normally thinks of developmental trajectories as a constant across historical time. Indeed, one of the theoretical problems in this field is that research in cultural psychology, including cultural developmental psychology, assumes that cultures are static rather dynamic. The Theory of Social Change and Human Development, in contrast, sees *change* in developmental trajectories as the constant. A major goal of the theory is to explain how, as sociodemographic environments change, cultural values, developmental patterns, and human psychology in general are transformed across generations. Because sociodemographic environments are changing throughout the world, the influence of social change on developmental patterns is an important domain in which theory is needed to guide empirical research and to understand the experiences of children and youth in the United States and around the world.

Sociodemographic environments are not static in either the developed or the developing world and therefore must be treated dynamically in developmental research. Worldwide sociodemographic trends include movement away from rural residence, informal education at home, subsistence economy, and low-technology environments (summarized as *Gemeinschaft*) and toward urban residence, formal schooling, commerce, and high-technology environments (summarized as *Gesellschaft*) (Tönnies, 1887/1957). These global trends generate a need for a strong theory of social change and human development (Greenfield, 2009a).

My research involving cross-generational comparisons over 2 decades in a Maya community in Chiapas, Mexico, has been summarized in Greenfield, Maynard, & Childs (2003b) and Greenfield (2004) and is detailed later in this chapter. Inspired by this work, I carried out a review of the relevant empirical research (Greenfield, 2009a) which demonstrated that, through adaptive processes, movement of any ecological variable in a Gesellschaft direction shifts cultural values toward greater individualism and developmental pathways toward more independent social behavior and more abstract cognition (e.g., Keller & Lamm, 2005; Raeff, Greenfield, & Quiroz, 2000; Saxe, 1999). Movement in a Gesellschaft direction also shifts information-seeking from reliance on the older generation within a family or community to reliance on multiple sources of information, and it shifts norms from absolutism (one correct way) to relativism (multiple perspectives concerning normative behavior) (Greenfield, 1994; Greenfield, Keller, Fuligni, & Maynard, 2003a; Manago, in press). In contrast, the (much less frequent) movement of any ecological variable in a Gemeinschaft direction is predicted to move cultural values and developmental pathways in the opposite direction on these continua.

A major strength of the theory is that it is not simply descriptive but also predictive—making it unique among current theories in culture and psychology. Given particular sociodemographic changes, the theory is able to predict the effects of those changes on pathways of development in both the social and cognitive domains. The theory is also unique in its parsimony: It utilizes the same principles to understand changing trajectories of human development, not only in two domains of development but also in two major contexts of sociodemographic change—one in which families remain in place while the sociodemographic environment changes (as in my intergenerational comparisons in Chiapas, Mexico) and one in which families emigrate to a different sociodemographic environment (as in my research on Latino immigrant families in Los Angeles).

The roots of the theory are multidisciplinary, drawing on sociology (Tönnies, 1887/1957) and anthropology (Redfield, 1941) to explain psychological phenomena. So too is the evidence used to support the theory: Data from anthropology and sociology are used to complement findings from psychology. An important foundation for this approach is the notion that a strong theory is not methodocentric but can be validated and illuminated at different levels of analysis by widely varying methodologies (Greenfield, 2000).

My theory of social change is founded on a multilevel causal model with sociodemographic characteristics of a community and individuals as the top

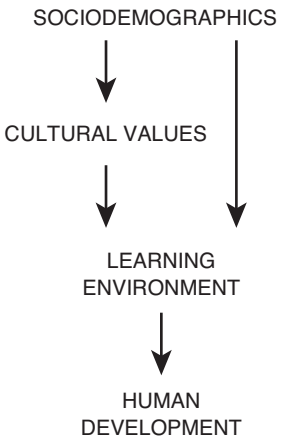


FIGURE 3.1: Multilevel causal model. (From Greenfield, 2009a).

level (see Figure 3.1). These characteristics include dimensions such as small-scale/large-scale in the ecological domain, subsistence/commerce in the economic domain, and lifelong relations/fleeting relations in the social domain. The right side of Figure 3.1 shows a direct route by which sociodemographic characteristics influence a child's learning environment; this learning environment, in turn, influences the child's development. The left side of Figure 3.1 shows an indirect route: Sociodemographic characteristics influence cultural values, with cultural values, in turn, influencing the child's learning environment. The adaptive processes are those processes by which a lower-level element adjusts to a higher-level element. That is, the developmental pathway of the child adapts to the learning environment, the learning environment responds to cultural values or to the sociodemographic environment, and cultural values reflect the sociodemographic environment.

Adaptation is an important concept. I see cultural values as adapted to and therefore influenced by sociodemographics. I developed the idea of sociodemographic causality in response to my frustration with the all-to-common assumption of homogenous nation-states with a single culture and a single set of cultural values. A more proximal influence in sculpting the idea of sociodemographic causality was the work of Heidi Keller and her concept of two prototypical environments, each with its own adaptive set of parental ethnotheories or values concerning childrearing goals (Keller, 2007). One type is as close as possible to the human environment of evolutionary adaptation, with its small village setting and subsistence economy. The other ideal type is the urban middle-class environment.

A child's learning environment is adapted to and can be directly influenced by sociodemographic factors. This notion has anthropological origins in Beatrice and John Whiting's materialistic (as opposed to idealistic) approach to the cross-cultural study of child socialization and development. A materialistic approach in anthropology means a focus on the causal role of the economy and other sociodemographic variables; an idealistic approach focuses on the causal role of symbolic culture, in particular a culture's value system. In their study of children of six cultures, the Whitings, identified the sociodemographic variable of societal complexity as a determinant of egoism (individualism) rather than altruism (collectivism) in child socialization and behavior (Whiting & Whiting, 1973, 1975). Their work was an important part of my graduate education. With hindsight, I see this insight as a first step toward construction of a theory of cultural pathways through universal development (Greenfield et al., 2003a), which eventually was expanded into the Theory of Social Change and Human Development (Greenfield, 2009a).

At the heart of my theory is the proposition that, as sociodemographic environments change, so too will trajectories of individual development, often mediated by changing cultural values. A key aspect of the theory is the way in which it conceptualizes the sociodemographic level of the model, a topic to which I now turn.

A. Two Sociodemographic Prototypes: Gemeinschaft and Gesellschaft as Theoretical Constructs

The terms defined by Tönnies (1887/1957), Gemeinschaft (community) and Gesellschaft (society), are my theoretical starting points for describing contrasting sociodemographic environments. Gemeinschaft and Gesellschaft are prototypes, each with their own particular characteristics, most visible at the extremes. Gemeinschafts, traditionally studied by anthropologists, are rural, small-scale, low-tech, homogenous, relatively self-contained communities, whereas Gesellschafts, traditionally studied by sociologists, are urban, large-scale, high-tech, heterogeneous, and permeable societies (Fiske, 1991). For each prototypical environment, there corresponds a value system, a learning environment, and a developmental pathway (Abels et al., 2005; Keller, 2007). Learning environments comprise the people and things with which the child interacts, the tasks that he or she is given to learn, and the ways in which values and emotions are socialized through social interaction.

Developmental pathways are cultural routes through universal stages of development; each stage builds on the preceding one in culturally structured

ways. Pathways are guided by cultural value systems and adapted to sociodemographic environments. For example, the developmental pathway adapted to a Gemeinschaft environment consists of maximizing familial interdependence and social intelligence, starting in infancy (when these values are manifested in the continuous bodily closeness of mother and baby) and continuing through adulthood (when familial interdependence is manifested in respect for and care of one's aging parents). A unitary viewpoint, creating interpersonal harmony, is also adaptive in a Gemeinschaft environment. Because Gemeinschafts are culturally and ethnically homogenous, there is little variability in early socialization patterns, and by young adulthood, it is simply assumed that there is only one correct way of doing everything (Manago, in press).

In contrast, the developmental pathway adapted to a Gesellschaft environment consists of maximizing independence, from infancy (when babies are left alone in cribs to play with their toys) through adulthood (when the goal is to be free of one's parents). Because Gesellschafts are culturally and ethnically heterogenous, there is greater variability in early socialization patterns, and by young adulthood, the concept of multiple perspectives has developed (Manago, in press). Respect for different points of view is adaptive in a heterogeneous social environment.

Developmental pathways and learning environments are crucial concepts for cultural psychology: Culture is acquired from infancy through processes of interactive learning. The cultural adult is the long-term result of this interactive developmental process. In summary, the concept of the culturally structured developmental pathway is that there is developmental continuity across the lifespan in the values that are expressed in thought, feeling, and action, but these values are expressed in stage-specific ways (Greenfield et al., 2003a). Another important component of the concept of the culturally structured developmental pathway is that the cultural expressions at different ages (or stages) build on one another developmentally—in much the same way as Piagetian stages of cognitive development build on each other (Piaget, 1954).

There were two intermediate steps that led to the ultimate formulation of my Theory of Social Change and Human Development. The first step was taken with the publication of the book, *Cross-cultural Roots of Minority Child Development* (Greenfield & Cocking, 1994). For that volume, I invited various author-researchers from around the world to trace the socialization practices at various life stages that produced the independent and interdependent selves described by Markus and Kitayama (1991). I paired these chapters with

chapters about the corresponding immigrant and minority group in the United States. For example, the anthropologist Takie Lebra wrote a chapter on maternal socialization in Japan, and the sociologist Barbara Schneider and her team provided one on family socialization in Japanese American families (Lebra, 1994; Schneider, Hieshima, Lee, & Plank, 1994). The fundamental concept was that readers could compare pairs of chapters to appraise how collectivistic or familistic socialization took place in the ancestral country and how it was both maintained and transformed in subsequent generations after immigration to the United States and immersion in its individualistic societal culture. Kim and Choi (1994) were able to make this comparison for Korean, Korean Canadian, and Korean American socialization in a single chapter. In terms of the contribution of this book to social issues, Algea Harrison wrote in a book review (1995) that *Cross-cultural Roots of Minority Child Development* marked the first time in the field that minority children and families had been compared with children and families in their ancestral home instead of with European American children and families in the United States.

One pair of chapters also contained the empirical beginnings of the notion that social change is transforming socialization in countries of origin in ways that are similar to acculturation of immigrant populations in the United States. Tapia Uribe, LeVine, and LeVine (1994) wrote about changing maternal behavior in Mexico as a function of increasing levels of maternal education, and Delgado-Gaitan (1994) wrote about intergenerational change in the socialization of Mexican American children in the United States.

The resulting book, *Cross-cultural Roots of Minority Child Development,* developed the idea of two basically different pathways of human development: a pathway toward interdependence and a pathway toward independence (Greenfield, 1994). This was the first step leading to the formulation of my Theory of Social Change and Human Development. The second step was taken with the publication of an article for the *Annual Review of Psychology* entitled, "Cultural pathways through universal development," in which Heidi Keller and I elaborated on the notion that there are two contrasting modes for navigating each universal developmental stage from infancy through adolescence and parenthood and that each mode is a foundational step for either the independent or the interdependent self (Greenfield et al., 2003a).

However, some theoretical problems remained: What were the determinants of each developmental pathway and its associated cultural values? Why were values heterogeneous within the same country? Why did people from different ethnicities have similar cultural values? These were the problems

solved by placing sociodemographics at the top of the causal model: Sociodemographics were the ultimate determinant of cultural values. This was the final conceptual step in arriving at the Theory of Social Change and Human Development. The theory predicted that a complex society with various social strata would produce value heterogeneity. Conversely, it predicted that sociodemographic similarities across different ethnic groups would produce value similarity. It also could make predictions about the results of various forms of social change.

Here is the heart of the matter: One pathway of development is well adapted to Gesellschaft environments, and the other pathway is well adapted to Gemeinschaft environments. When any sociodemographic variable (e.g., formal education, technology, wealth, urbanization) moves in one direction or another, so does the pathway of development. These theoretical links form the foundation for the essential postulate linking social change to developmental change, the ultimate goal of the theory. Let me now elaborate on these fundamental concepts.

1. How are Gemeinschaft and Gesellschaft Environments Defined?

The central concepts of Gemeinschaft and Gesellschaft, as introduced by the German sociologist Tönnies in 1887 (1957) have much in common with Redfield's (1941) anthropological contrast between folk society (corresponding to Gemeinschaft) and urban society (corresponding to Gesellschaft). The integrative interdisciplinary nature of these concepts is seen in the fact that anthropologists have traditionally studied Gemeinschaft environments, whereas sociologists have traditionally studied Gesellschaft environments (Fiske, 1991). The two prototypes are defined in terms of sets of contrasting sociodemographic characteristics (see Figure 3.2). Prototypes are useful in analyzing change because they "establish the 'outer limits' or standards by means of which the processes of change or intermediate ... forms can be comprehended from the perspective of [a] continuum" (p. 12, Loomis & McKinney, 1988).

In line with this idea of a continuum, I conceptualize the prototypical sociodemographic characteristics as dimensions. (Tönnies, in contrast, conceptualized them as binary categories.) Consequently, in my theory, each prototypical environment is composed of a set of continuous dimensions that are anchored at the extremes by relatively pure Gemeinschaft and Gesellschaft environments. The dimensions fall into three main categories: ecology, economy, and

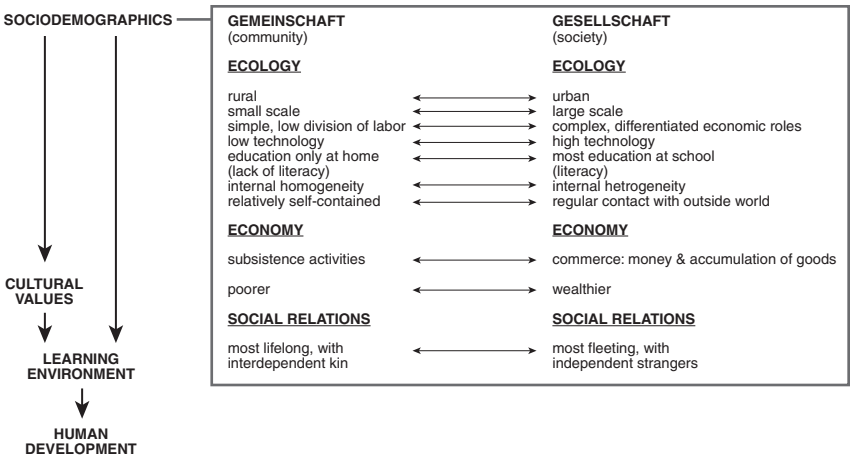


FIGURE 3.2: Top level of the model in detail: Sociodemographic dimensions differentiating Gemeinschaft (community) from Gesellschaft (society). The double-sided horizontal arrows indicate that the variables are dimensions rather than binary concepts. The vertical arrows indicate the dominant causal relations. (From Greenfield, 2009a).

normative social relations (see Figure 3.2). The key sociodemographic variables in my own research program, to be described next, are the ecological dimensions of rural/urban, low-tech/high-tech, and education at home/education at school and the economic dimension of subsistence/commerce.

2. Relationship of Gemeinschaft and Gesellschaft to the Concepts of Individualism, Collectivism, and Familism

The terms *collectivism* and *individualism* summarize social adaptations to the two types of environment. A theoretical problem with the term *collectivism* is that it can be used to refer to any collectivity or ingroup; however, adaptations to Gemeinschaft involve prioritizing the family as the key collectivity and ingroup. Therefore, the term *familism* is probably more accurate (Sabogal, Marín, Otero-Sabogal, Marín, & Perez-Stable, 1987).

Familistic qualities, such as sharing among the extended family, are more adapted to the daily practices of Gemeinschaft environments, such as living in a one-room house. Individualistic values, such the value of privacy, are better adapted to the characteristics of Gesellschaft environments, such as houses with separate bedrooms. However, the these two terms do not adequately describe *cognitive* adaptations to the two types of environment; the ecologies have greater explanatory generality than that encompassed by the terms individualism, collectivism, and familism.

Perhaps most important, individualism, collectivism, and familism, as well as cultural values more generally, are no longer seen as the governing causal level, as they were in earlier theories. Instead, cultural values are seen as an intermediate level, strongly influenced by sociodemographic factors in the macroenvironment.

B. Linking Sociocultural Change and Developmental Change: Major Predictions

Over historical time, groups experience changes and transformations in their worlds, usually in the direction from more Gemeinschaft to more Gesellschaft. Because different qualities, skills, and social relations become adaptive, this shift provides a motor for social and psychological change. As a consequence, the theory predicts a dynamic that shifts pathways of socialization, individual development, and modes of learning so that the developmental trajectories of individuals become better adapted to more Gesellschaft conditions as the environment shifts in that direction.

There are two kinds of processes that can lead to shifts from more Gemeinschaft to more Gesellschaft conditions. Globalization notwithstanding, one shift is more endogenous, the other more exogenous. Relatively endogenous change can be exemplified in postwar Germany: German society became richer, more commerce driven, and more high tech oriented, and educational opportunities expanded (Keller & Lamm, 2005). In the developing world, the Maya communities in Guatemala and in Chiapas, Mexico, exemplify the same direction of movement toward economic commercialization, high technology, and more formal education, although each of these sociodemographic variables began its dynamic path (starting in the 1970s) much closer to the Gemeinschaft prototype than was the case in Germany or the United States (Chavajay & Rogoff, 2002; Rogoff, Correa-Chávez, & Navichoc-Cotuc, 2005; Greenfield, 1999, 2004). Change is always relative to the starting point: The theoretically based predictions relate to the *directions* of change, not to absolute end points.

However, the individual is not a passive pawn in this process; rather, it is the active individual who creatively constructs adaptations to changing conditions. This active construction was revealed in Manago's interviews with the first generation of Maya university students in Chiapas, Mexico. These young people were navigating their journey from village to city and a brand new road to higher education. In their mothers' generation, only elementary schooling was available. Adapting to the ethnic heterogeneity of the urban environment,

they were constructing the value of multiple perspectives, which they contrasted with the village value of "one right way." Adapting to an educational environment in which boys and girls were theoretically equal, they were constructing a value of gender equality, which they contrasted with the village value of gender hierarchy (with males on top) (Manago, in press). The interviews made clear that these changes involved active negotiation and harmonizing of these new values with the worldview to which the students had been exposed while growing up in Maya villages.

Not only are ecologies and environments transformed over time; people also move from one ecology to another. This is the more exogenous source of change. The terms *endogenous* and *exogenous*, as used here, are relative rather than absolute: Global economic development affects individual countries' economic and social development, and internal factors can impel immigration to other countries. However, I am using the term endogenous when people stay put in the same social environment, which changes around them. I am using the term exogenous when people move from one social environment to another. Exogenous change has become a global trend: Around the world, people from poorer, more Gemeinschaft worlds immigrate into richer, more Gesellschaft worlds, resulting in contact and influence between these worlds (Greenfield, 2006).

This intercultural contact also provides a dynamic motor for social and psychological change. Under these conditions, the theoretical model predicts that children will be subjected to cross-cutting currents, receiving socialization messages at home that continue to be adapted to the more Gemeinschaft environment in which the parents grew up while at the same time receiving conflicting socialization messages from representatives of the more Gesellschaft host society, such as teachers (Greenfield, 2006). Eventually, these forces will shift immigrant development in a direction that is more adapted to a Gesellschaft world (e.g., Suzuki & Greenfield, 2002). Thus, the theory joins together the study of a community over time with the study of the immigration process. Its use in the latter context has led to an applied program of research called Bridging Cultures. This application is discussed at the end of this chapter.

C. Relationship to Modernization Theory

The movement from Gemeinschaft to Gesellschaft has been defined as modernization, and it lies at the heart of the dominant strand of modernization theory in sociology (Tipps, 1973). This is because Gemeinschaft communities

predated Gesellschaft societies historically. However, the Theory of Social Change and Human Development differs from modernization theory in several important ways and thereby avoids many of the criticisms of modernization (Tipps, 1973; Kağitçibaşi, 2007):

1. The Theory of Social Change and Human Development makes no value judgments about Gesellschaft being better than Gemeinschaft, nor is movement in the Gesellschaft direction seen as "progress." Instead, each ecology is seen as promoting different pathways of human development, with its own pattern of strengths and weaknesses. Movement in the Gesellschaft direction is therefore seen as entailing developmental losses as well as gains.
2. The Theory of Social Change and Human Development does not see social movement as unilinear. In theory and in practice, movement can go in both directions, with predictable effects. However, in practice, movement in one direction—the Gesellschaft direction—has been more frequent in the world. Moreover, unlike modernization theory (and unlike Tönnies [1887/1957]), the present theory does not view sociodemographic variables as moving either in concert or in a Western-style order. Instead, different variables can move at different rates; order and rate of movement vary from culture to culture and from society to society. What is theoretically important is that, even though the variables may shift unevenly, the change from more Gemeinschaft to more Gesellschaft characteristics always moves socialization and development in a given direction. Sociodemographic movement in the other direction, as in the current economic downturn, would be predicted to move learning environments and pathways of development in the opposite direction.
3. Whereas modernization theory tends to see modern societies as more homogeneous than traditional societies (Geertz, 1963), the Theory of Social Change and Human Development, like that of Triandis (1989), sees them as more heterogeneous and views traditional cultures as comparatively homogeneous because of their relative isolation from other contrasting cultures in the same country. In this view, multiculturalism, along with social class differences, makes modern societies more heterogeneous.

4. Modernization theory is reductionistic, ignoring detailed cultural differences between different "modern" societies or between different "traditional" communities. While focusing on abstract general descriptions of values and behaviors, the Theory of Social Change and Human Development acknowledges the very different particular expressions that values and behaviors may take in different cultures and societies. An example is the value placed on respecting people who are older than oneself. In East Asia, this value is embodied in filial piety, and the child-parent relationship is its central expression (Suzuki, 2000). Although respect for those older than oneself is also an important value for the Zinacantec Maya of Chiapas, Mexico, a different relationship—that of younger brother to older brother—has traditionally functioned as the prototype of the same concept (Vogt, 1969). This example illustrates an important point for researchers: It is only through in-depth and detailed study of particular phenomena (e.g., the different expressions of age-related respect), often starting with ethnography, that a general value can be meaningfully uncovered, one culture at a time.
5. Whereas in modernization theory (and in Tönnies [1887/1957]) the Western prototype is seen as fixed (Kağitçibaşi, 2007), the Theory of Social Change and Human Development sees Western societies as also in a process of movement, usually toward more extreme Gesellschaft values, on various dimensions. Accordingly, there is no final Gesellschaft prototype; there are simply Gesellschaft variables and a Gesellschaft direction. For example, technology continues to develop and to become more widespread, and the world's wealth has increased as global commerce has expanded (Deaton & Paxon, 2001).
6. Modernization theorists in sociology generally do not consider the implications of their theory for child development, the central focus of this theoretical formulation.

III. ORIGINS OF MY PROGRAM OF RESEARCH

In my first Harvard course during freshman year in college, I became completely fascinated by a theme that has, ever since, animated my research and theorizing in cultural and cross-cultural psychology. In the introductory

survey course in the Department of Social Relations, an interdisciplinary mix of social psychology, social anthropology, and sociology, we read *The Passing of Traditional Society,* by sociologist Daniel Lerner (1958); it was about the modernization of Turkey. I was captivated by the idea that macro-level social change can change individual psychologies. And I was fascinated by Lerner's discovery that in rural Turkish villages with low levels of formal schooling and low media exposure, people did not have individual opinions, and therefore opinion polls were meaningless, whereas with influences such as modern technology (media), higher levels of formal education and wealth, and urbanization, implicit shared norms gave way to verbalized personal opinions. At that time, I never dreamed that I would be able to contribute research that was relevant to this theme. The theme seemed so large, and an original contribution seemed impossible for a mere freshman in the first semester of her college career.

But I was mistaken. In fact, my contribution started with my dissertation, although I did not realize it at the time. For my dissertation research, I systematically studied the impact of formal schooling and urbanization on cognitive development (Greenfield, 1966; Greenfield & Bruner, 1966; Greenfield, Reich, & Olver, 1966). Perhaps a lack of historical perspective in the disciplines of psychology and anthropology of the time was the reason I did not make the connection between these sociodemographic factors and historical change. To me, the sociodemographics were simply independent variables rather than indicators of historical change. Hence, my consideration of social change was implicit rather than explicit. As my journey unfolds, I think that the reader will see that the evolution of my cross-cultural research went from implicit to explicit consideration of the role of social change in human development. It also moved from foreign cultures to the United States, where I became aware not only of immigrant cultures but also of the largest sociodemographic shift our society was experiencing, the growth of new communication technologies. I became interested in how both technology and the immigration experience were affecting the trajectory of human development (Greenfield, 1984, 2006).

IV. EMPIRICAL EVIDENCE

The Theory of Social Change and Human Development was formulated after most of the research to be presented had been completed; it unified empirical findings and predicted (or more correctly, postdicted) observed results. Indeed, it was those results that inspired the theory's development and made

it possible. The theory lends coherence to the array of sociodemographic factors (seen in Figure 2) that have served as independent variables in my research program: formal education, commerce, urbanization, and technology. I will take up the empirical results relating to each of these in turn and, as much as possible, in the chronological order of the research. Although I am discussing one at a time and have isolated them in many of my empirical studies, their functional equivalence and synergistic action are predicted by my Theory of Social Change and Human Development.

A. Formal Education

Guided by my graduate mentor Jerome Bruner, armed with some ideas about the Whorfian hypothesis from my teacher Roger Brown, and funded by the Ford Foundation, I went to Senegal to collect data for my dissertation. In the end, not only did my data add evidence for the intertwining of social change and psychological change, but, even more specifically, I added evidence to that presented by Lerner (1958) concerning the irrelevance of personal opinions in traditional society. Indeed, I found such evidence to be present very early in development. In a cognitive experiment, Wolof children from a bush village who had not been to school responded with uncomprehending silence to the following type of question: "Why do you *think* that thus and such is true?" However, they would often answer quite easily to questions of the type, "Why *is* thus and such true?" They could explain an objective reality, but they did not have the concept of a subjective opinion (Greenfield, 1966; Greenfield & Bruner, 1966).

On the other hand, Wolof children who were enrolled in elementary school could answer the question when it was posed in terms of a subjective opinion. Cole and Scribner (1974) interpreted this difference as being related to the influence of schooling, because in school, it is common practice to ask students to justify their answers. Although I did identify the influence of schooling, what I did not realize at the time was that I had carried out a cross-sectional study of social change. Historically speaking, schooling represented an influence for social change because it had been introduced into oral Wolof culture by the French during the colonial period.

There was another finding in my dissertation research that I did not then recognize as a marker of social change: the fact that, among Wolof young people, only those who had attended school could classify a given group of objects or pictures according to various criteria; unschooled children and adults were limited to but a single basis for equivalence (Greenfield et al., 1966). Figure 3.3

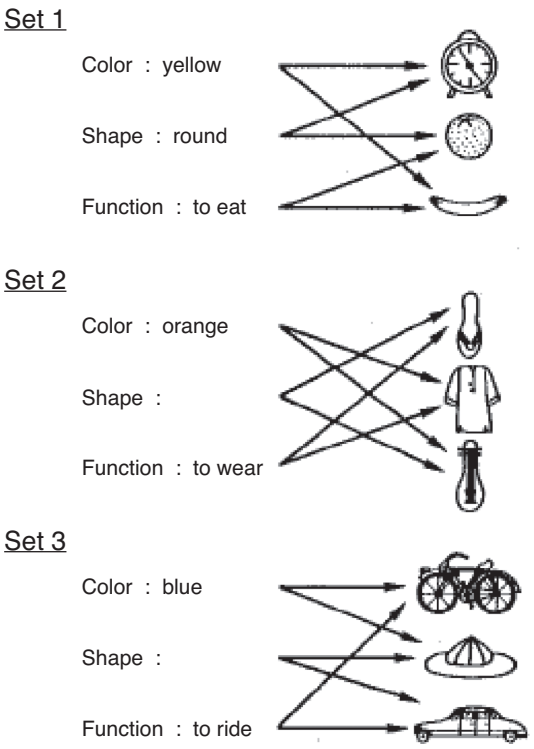


FIGURE 3.3: The three picture displays with their attributes used to study categorization by Wolof participants,. *Set 1*—clock, orange, banana; *Set 2*—sandal, *bubu* (Wolof robe), guitar; *Set 3*—bicycle, helmet, car. The colors noted were the dominant colors of the original stimuli. (From Greenfield, Reich, & Olver, 1966).

shows the organization of the picture stimuli. When asked to pick two of the three pictures in each set that were most alike, school children could use color, shape, or function as the basis for pairing pictures. Unschooled children (and even unschooled adults) could use only one criterion (color) to categorize objects.

Figure 3.4 shows that school children developed multiple ways to group the stimuli, adding shape and function to color as they got older. In essence, they individuated in their perspectives on the stimuli. Schooling had the effect in both village and city (Dakar) of adding the criterion of shape or form as a basis for similarity grouping. (The additional impact of the urban environment is discussed in the next section of this chapter.)

Schooling also promoted a more abstract approach to the task. Grouping reasons could be expressed more or less abstractly. Compare, for example, the "This one is round; that one is round" with "They are both round." The latter

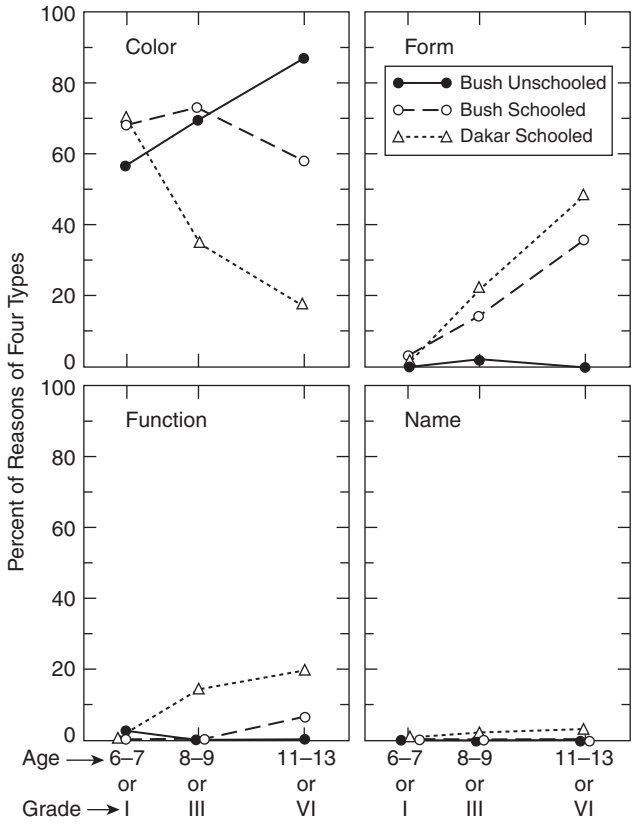


FIGURE 3.4: Percentage of children providing four types of reasons for grouping objects: color, form (shape), function, and name. "Name" referred to reasons such as, "The orange and the banana go together because they are both fruit." This type of grouping reason was used extremely infrequently in all groups. (From Greenfield, Reich, & Olver, 1966).

reason is expressed more abstractly because it is not tied as closely to the specific exemplars—for instance, does not require indexical pointing. We called the former *itemized* superordinate language structure and the latter *general* superordinate language structure. The term *superordinate* here simply means that the named characteristic belonged to all the items. Figure 3.5 shows that the more abstract general superordinate language structure developed with age in both groups of school children but not in the unschooled group.

B. Commerce

My next and continuing project in culture and psychology came when I had the opportunity to go to Chiapas, Mexico, in 1969 and do research in

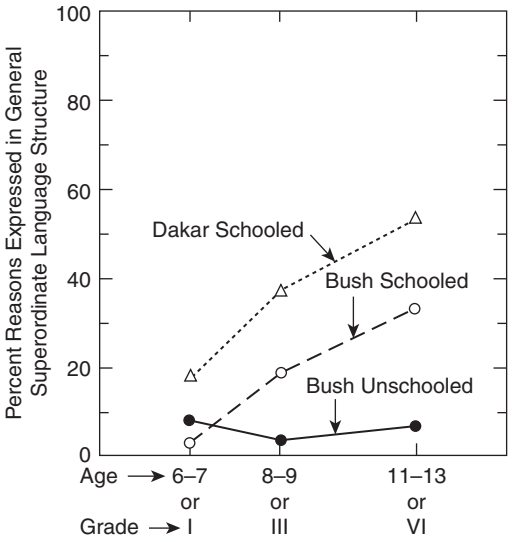


FIGURE 3.5: Percentage of children expressing four types of reasons for grouping of objects in general (as opposed to itemized) superordinate language. (From Greenfield, Reich, & Olver, 1966).

Nabenchauk, a Zinacantec Maya community; I went as part of a research team called the Harvard Chiapas Project, directed by anthropologist Evon Z. Vogt. I went to Chiapas with the intention of studying culture and cognitive development, as I had in Senegal. Whereas in Senegal I had adapted tasks from U.S. and European research on cognitive development, I wanted to do something different this time. I felt that, despite adaptation, I had been testing the Senegalese children on our cultural tricks rather than their own. Like the Wolof, the Zinacantec Maya did not have formal education or writing as part of their culture. Influenced by Douglass Price-Williams' study of pottery-making and conservation development in Mexico (Price-Williams, Gordon, & Ramirez, 1969), I set about to identify what was at the center of their informal education process. The most promising answer was weaving, the most cognitively complex skill in the culture. Weaving was also a female activity, one to which I would have access in a gender-segregated culture. So, with Carla Childs, an undergraduate anthropology major, I did two studies that centered on the role of weaving in learning and cognitive development (Childs & Greenfield, 1980; Greenfield & Childs, 1977).

In terms of cognitive development, I began with the idea that one of the cognitive components of weaving is pattern representation; Zinacantec weaving was at the time limited to a few striped patterns. Based on this situation,

FIGURE 3.6: A Zinacantec Maya participant places sticks in a frame as the experimenter, Carla Childs, looks on (Nabenchauk, Chiapas, Mexico, 1969). Photograph by Sheldon Greenfield.

we created an experiment that gave our participants an opportunity to represent the red-and-white striped male poncho and the red-and-white striped female shawl by placing colored sticks in a frame (see Figures 3.6 and 3.7).

We found that weaving did have an impact on pattern representation. Teenage girls, who were generally expert weavers, represented the patterns in a detailed or thread-by-thread manner, similar to the way in which they were constructed (see Figure 3.8). In contrast, teenage boys, who did not participate in this strictly female activity, represented the two patterns in a more global fashion, differentiating the poncho and the shawl by color (see Figure 3.9) or by the width of the stripes. Both of these strategies represented and differentiated the patterns as they might appear from a distance: One could not see the construction details and the narrower stripes of the red and white poncho, giving it an overall appearance of being pink.

But what was most relevant to our subsequent study of social change was the difference between the teenage weavers and a group of European American college students who were not involved in learning to weave. Equally as accurate as the Zinacantec weavers, these students represented the patterns in a more abstract fashion, rather than in a detailed thread-by-thread manner (see Figure 3.10). The Zinacantec weavers grouped thin sticks together to represent a broad stripe, just as in weaving one would group individual threads

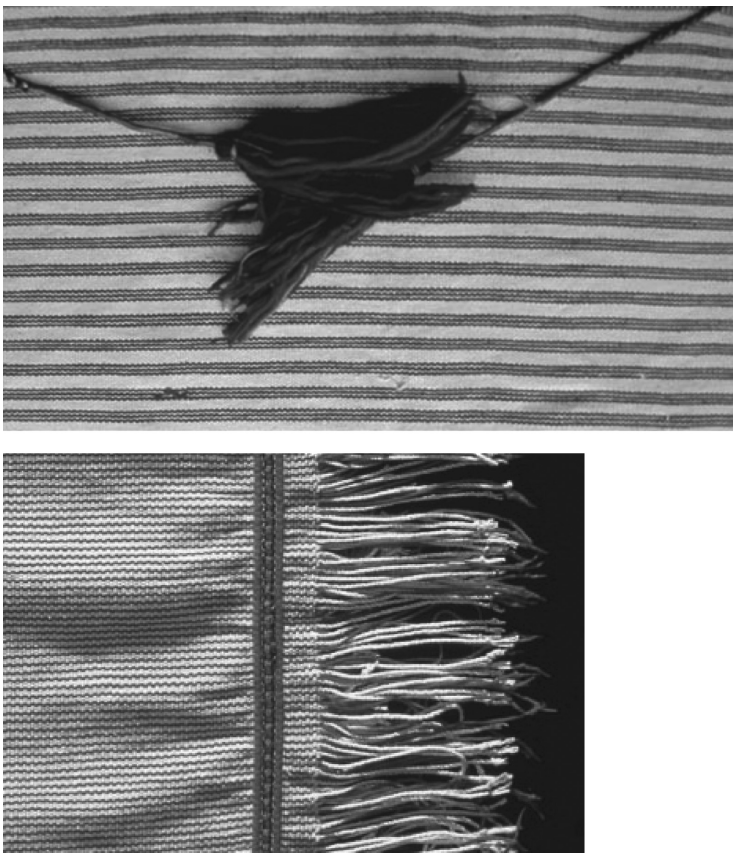


FIGURE 3.7: Pattern of a woman's shawl *(top)* and a man's poncho *(bottom)*, both 1969. Note that the shawl's wide gray stripes are composed of three thin gray lines separated by two thin white lines. © Lauren Greenfield/INSTITUTE.

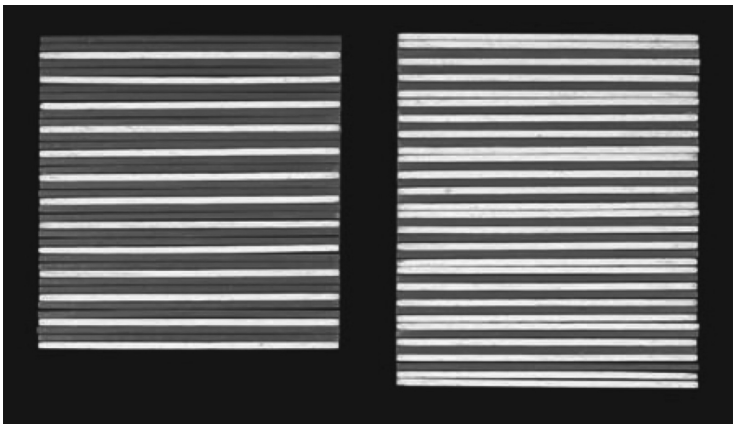


FIGURE 3.8: Detailed thread-by-thread analysis of Zinacantec Maya poncho *(left)* and shawl *(right)*. Note that the broad stripes are each composed of multiple narrow sticks. (Red sticks appear as grey in this photo.) Photograph by Don Cole.

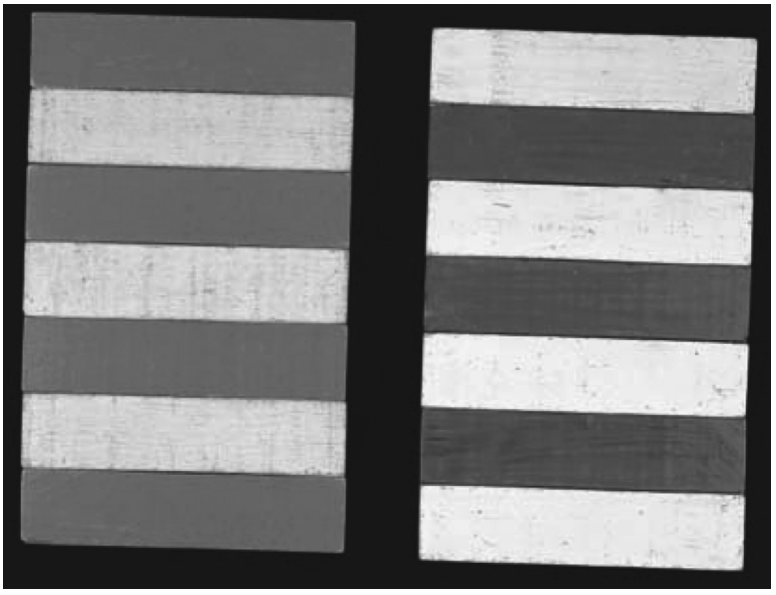


FIGURE 3.9: Representation of Zinacantec poncho *(left)* and shawl *(right)* using color to differentiate them. In the poncho representation on the left, broad orange sticks made up the darker stripes in the original design, while broad pink sticks made up the lighter stripes. In the shawl representation on the right, broad red sticks made up the darker stripes in the original design, while broad white sticks made up the lighter stripes. Photograph by Don Cole.

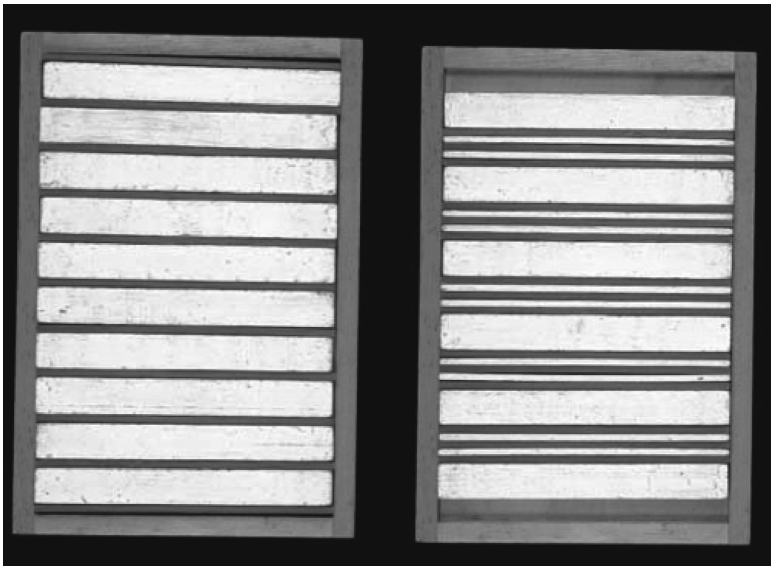


FIGURE 3.10: Soon after our return from the field in 1969, U.S. college students used an abstract style of representation to differentiate the patterns of the Zinacantec Maya poncho *(left)* and shawl *(right)*. (The red appears as gray in this photo.) Photographs by Don Cole.

together to construct a broad stripe. In sharp contrast, the college students used a single broad stick to represent a broad stripe, thus erasing the detail of individual threads and simplifying the design, one of the hallmarks of abstraction. I was not at all focused on the issue of social change at that time. However, the college students, perhaps as a result of their formal education, manifested a clear strategy difference from both boys and girls in the Zinacantec hamlet of Nabenchauk. This was a difference that, 2 decades later, provided me with a marker of social change and its effect on abstraction.

Although our results were interesting and Zinacantec children and teenagers loved to "stack the sticks," as they put it, I was still not satisfied with this experiment. I wanted to go farther in the direction of cultural familiarity. The very format of a cognitive experiment was culturally foreign to Zinacantecs; indeed, the very idea of representing a woven pattern using sticks was foreign in a culture that included no activities of visual representation. My next step, therefore, was to move from studying a *representation of* weaving to studying weaving itself, in situ. I had the idea of investigating learning and development in cultural context by means of a video study of weaving apprenticeship. I used a developmental research design in which girls at different ages and skill levels were videotaped as they learned to weave in their home courtyards. Microanalysis of the video data revealed a highly socially guided process in which teachers (usually mothers) provided developmentally sensitive and supportive scaffolding, generally anticipating and preventing errors before they happened (Childs & Greenfield, 1980).

An important way in which the weaving teachers provided this scaffolding to learners was through multimodal communication. Such communication combined language with nonverbal elements: teacher doing the task for the learner, guiding the girl's body, or pointing to some element in the loom or weaving. For the least experienced learners, the majority of the teacher-initiated interactions (68%) combined verbal and nonverbal elements. This figure declined steadily with increasing experience, reaching 34% for the most experienced girls (Childs & Greenfield, 1980). Because the multimodal messages provided more explicit information, they required less knowledge of weaving to comprehend. Therefore, teachers showed their developmental sensitivity by constructing a lower proportion of multimodal messages as the learners gained experience.

Video studies of mother–infant and mother–child interactions were just starting to be done in Bruner's laboratory at the Harvard Center for Cognitive Studies. However, mine was the first video study of informal education in situ.

For recording, I used the Sony PortaPak, the first portable video camera, which had been launched just a few years earlier. Without this serendipitous technological development, the study could not have been done.

From the conceptual perspective, my study introduced to the field the idea that cultural socialization is an interactive process that can be studied in detail in a naturalistic situation. In collecting such data on informal education in 1970, I was at the forefront of a new development in culture and psychology. Early results were presented in "Cognitive Aspects of Informal Education" (Greenfield & Lave, 1979, 1982), which was termed by distinguished cross-cultural psychologist Pierre Dasen a "landmark paper" (Dasen, 2005). The collaboration with anthropologist Jean Lave integrated her ethnographic and experimental studies of the informal education of tailors in Liberia with my video study of the informal education process of learning to weave in a Maya group in Mexico and its cognitive implications. We also contrasted the features of formal education with those of informal education, noting, for example, that the latter (but not the former) is embedded in daily life activities and that learning by observation and imitation is central. The study was included in the first collection of research papers on informal education, which did not appear until 1984 (Rogoff & Lave, 1984).

Back in the United States, I had a serendipitous opportunity to see how backstrap loom weaving was taught in our country. I saw an advertisement in a Boston newspaper for a backstrap loom weaving class, and I went. What I found was something that I had never seen in Nabenchauk. As background, let me explain that the weaver's body is part of the backstrap loom, and the weaver must lean back in the loom to keep the tension in the warp or frame threads. This was something that I took for granted in Nabenchauk, because even rank beginners leaned back to keep the warp threads taut. However, this was not the case in the backstrap loom class in Cambridge, Massachusetts. The adult learners were leaning forward in the loom, and looms were collapsing throughout the room! At that point, I realized that there were two basically different ways to teach and to learn. One was through social guidance, and one was through trial and error—what I was seeing in that backstrap-loom weaving class.

As I gathered more information about teaching weaving in other cultures, notably Guatemala (Loucky, 1988), I developed a theory of two modes of teaching and learning, each one connected with a distinct set of cultural values. One mode was what we had found in Chiapas: learning in which the teacher carefully guides and prevents errors through helping the learner or

even taking over when a part of the process is beyond the learner's present capabilities. The other mode was trial and error, which is what I saw in Cambridge (Greenfield & Lave, 1982). On further thought, I connected these two modes of teaching and learning with two different sets of values, one that places a high value on maintaining tradition, and one that places a high value on innovation. The connection was the following: If you are being guided by an expert of the older generation, your weaving will naturally replicate the traditional patterns. If you are learning independently by trial and error, you are more likely to discover something new.

These two modes of learning became the basis for a study of social change and its impact on learning to weave in Nabenchauk's next generation when we returned to the community in 1991, at a time when it was undergoing a process of rapid social change. This conceptual framework became the basis for predicting what would happen to weaving apprenticeship during the economic shift from subsistence and agriculture to money and commerce. But I am getting ahead of my story.

About 16 years after leaving the community of Nabenchauk, while on sabbatical in Cambridge, Massachusetts, I had the opportunity to hear anthropologist Frank Cancian, an alumnus of the Harvard Chiapas Project, give a lecture on his recent research in the community of Zinacantán, of which Nabenchauk is a part. He spoke about how Zinacantec farmers had become merchants with the introduction of trucks and vans by the Mexican government (Cancian, 1992). As his lecture progressed, I realized that these farmers were becoming entrepreneurs and that entrepreneurship places an intrinsic value on innovation. Although I did not yet have clues to the specific mechanism, I hypothesized that innovation might also have entered Zinacantec woven patterns and that more independent, trial-and-error weaving might have entered weaving apprenticeship. After the lecture, I approached Frank and asked him whether he had noticed any new textile patterns in Zinacantán during the economic changes he had described. He replied that flower designs were everywhere. Because such designs were entirely new, it seemed that my first theory-based hypothesis was confirmed. Encouraged by this confirmation, Carla Childs and I returned to Chiapas a few years later, in 1991, to test the second hypothesis: that girls would be learning to weave more independently and would put increased reliance on trial-and-error learning processes.

Based on the representational strategy of the U.S. college students, who of course were part of a very entrepreneurial society, I also hypothesized that more abstract pattern representation would be demonstrated in Zinacantec

responses to the pattern representation task. Another part of the experiment that had been carried out 2 decades earlier was the task of representing novel patterns (i.e., striped patterns that were not part of Zinacantec culture). I hypothesized that placing a higher value on innovation would lead to better performance on the representation of novel patterns, such as the one shown in Figure 3.11, and this was exactly what we found when we repeated the experiment in 1991. Our other hypotheses were also confirmed: Weaving apprenticeship had become more independent, and abstract representation of familiar woven patterns was now a component of Zinacantec representational strategies (see Figure 3.12).

These cross-generational comparative studies also elucidated the mechanisms by which the sociodemographic changes influenced the learning environment and cognitive development. We found that, for each of the changes in learning and cognition, the change was concentrated in families who had become more commercially active and who had moved the farthest beyond subsistence economic activities (Greenfield et al., 2003b). This was the key to identifying proximal mechanisms of change. Structural equation modeling showed, for example, that mother–daughter involvement in textile commerce was causally linked to independent weaving apprenticeship (see model in Figure 3.13). Our ethnography gave clues as to one reason why: Mothers who

FIGURE 3.11: Paxku' Pavlu, age 9, studies a culturally dark gray-and-light gray striped pattern that Carla Childs, the experimenter, has started for her to complete (Nabenchauk, 1991). © Lauren Greenfield/INSTITUTE.

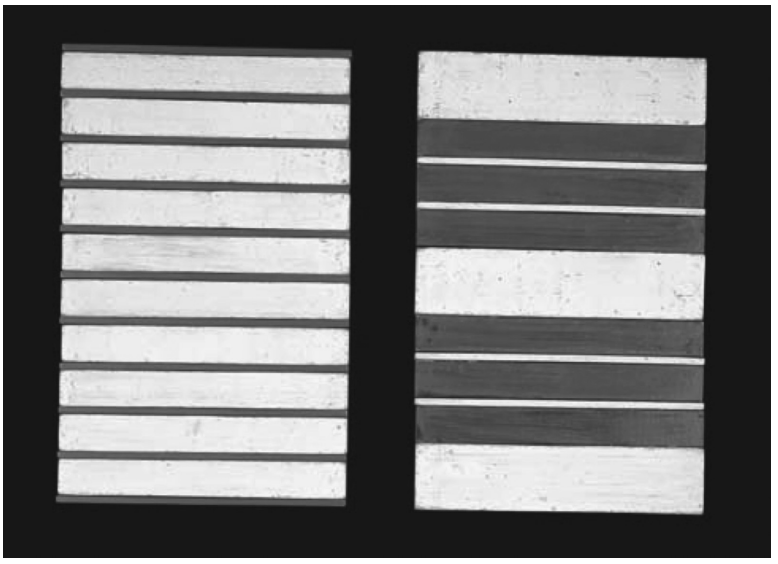


FIGURE 3.12: Abstract representation of Zinacantec Maya poncho *(left)* and shawl *(right)* (Nabenchauk, 1991). (Red sticks appear as grey in this photo.) Photograph by Don Cole.

were commercially active often were away, working at distant markets, leaving even beginner weavers to learn on their own.

Structural equation modeling also showed that family involvement in commerce was causally linked to skill in representing novel patterns (see model in Figure 3.14). In the real world of commerce, novel woven and embroidered designs were an adaptation to the textile market outside the community. Even more so in the internal Zinacantec market, there was a constant process of innovating and complexifying woven and embroidered designs (Greenfield, 2004).

C. Urbanization

Whereas during the 2 decades that separated my two periods of data collection in Chiapas, the movement from subsistence and agriculture to money and commerce was the driving force behind the transformation of Zinacantec Maya learning and cognitive development, in the subsequent 2 decades the operative forces were the expansion of formal education and accelerating urbanization. During this period (the time required for the next generation to attain the age range of the last two), we carried out a small natural experiment on the effect of urban residence. A Nabenchauk family I knew rented a warehouse in the neighboring colonial city of San Cristobal. When I arrived in the

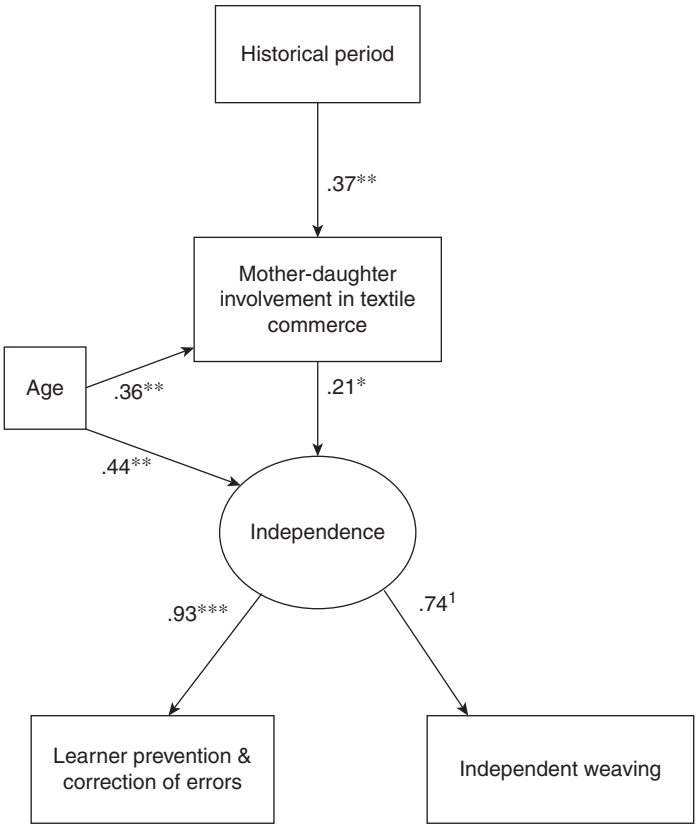


FIGURE 3.13: Structural equation model of the historical change in weaving apprenticeship. Comparative fit index (CFI) = .973; $\chi^2(4) = 5.606$ ($N = 45$), $p = .231$. (In structural equation modeling, a nonsignificant chi-square value with a high rather than the usual low probability value indicates good fit to the model.) Significance level of individual links: *$p < .05$; **$p < .01$; ***$p < .001$. The key link is the significant link between mother–daughter involvement in textile commerce and learner independence. The numbers in the model are coefficents indicating the strength of a particular link. . 1: Path was fixed prior to running the model. Error labels are omitted for simplicity. (From Greenfield, Maynard, & Childs, 2003).

summer of 2007, they had had the warehouse for about 6 months and were using it to sell agricultural goods, both edible goods and flowers, to retail and wholesale markets. Some of these goods were purchased in Mexico City or Tapachula by the father of the family and transported to the warehouse to sell. Other goods were purchased in the market by the mother and readied for the father to sell on his weekly trips to Tapachula or Mexico City. The natural experiment stemmed from the fact that the girls and women in the family were spending half of each week in the village and half in the city.

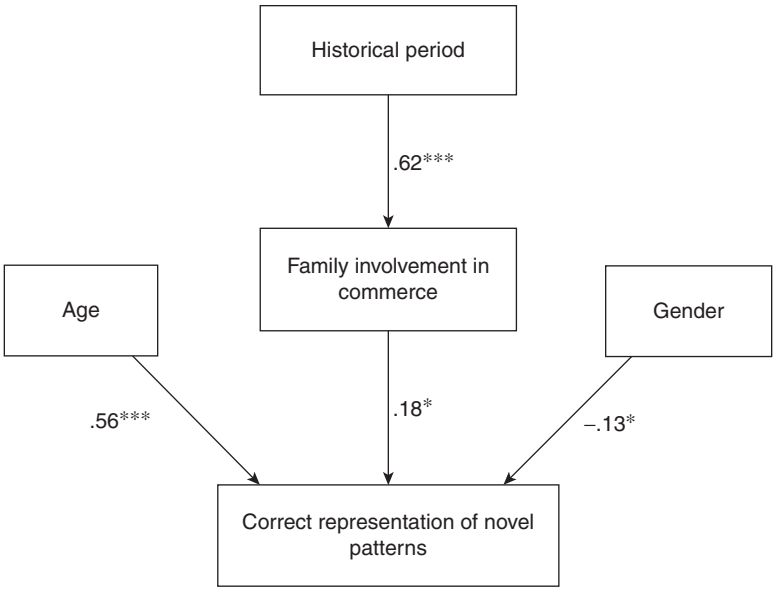


FIGURE 3.14: Path model of the historical change in representation of novel patterns. CFI = .969. $\chi^2(6) = 11.123$ ($N = 178$), $p = .085$. Significance level of individual links: * $p < .05$. *** $p < .001$. Error labels are omitted for simplicity. For the gender variable, boys = 1, and girls = 2; the negative link from gender indicates that boys correctly represented more novel patterns than girls did. The key link is the significant causal relationship between family involvement in commerce and correct representation of novel patterns. The numbers in the model are coefficents indicating the strength of a particular link. Error labels are omitted for simplicity. (From Greenfield, Maynard, & Childs, 2003).

With graduate student Alethea Martí, I did systematic ethnography, spending equal observation time in both city and country; we used Weisner (2002) as the source for an ethnographic observational rubric (Greenfield, Maynard, & Martí, 2009). Our participants were from a family that included two adolescent girls and two young female adults, none of whom were married at the time, although one was a widow and the mother of a young child. Our comparative observations elucidated some major social effects of movement to an urban environment. Comparing their life in village and city, we found that there were two main differences. In the village, young women were not allowed to have unchaperoned contact with the opposite sex (Martí, 2007); and indeed, during our observation period, no unchaperoned contact was observed in the village. In the city, the situation was very different: We observed considerable unchaperoned contact in the family's *bodega* (warehouse). In this way, the females were on the front lines of social change,

as so often happens. The other difference in the city was the possibility of interethnic contact (e.g., when Ladino Mexican clients came into the bodega to buy goods); interethnic contact was observed in the urban bodega but not in the rural village.

A few years later, this combination of unchaperoned contact with the opposite sex and interethnic contact in the urban setting led to a marriage between a member of the family and a Ladino whose family lived in a distant city. (*Ladino* is the local term for someone who identifies as Mexican and not indigenous, although the person may have more or less indigenous ancestry. Elsewhere in Mexico, the corresponding term would be *Mestizo*.) This was not the first time in the family that commerce in an urban area had led to intermarriage. However, it was the first time that it had occurred for a female member of the family, and the marriage was not accepted by her family.

Movement from rural to urban residence had other, related impacts on a set of pioneer Maya women who also migrated to the city. These were the first Maya women to have public, professional careers. They founded and were members of a women's theater group called FOMMA (Manago & Greenfield, 2001). Interviews with four of these women showed that they were moving from greater interdependence with family to more independent values and lifestyles. They were moving from Gemeinschaft-adapted gender roles in which men were above women in a status hierarchy to more egalitarian gender roles better adapted to a Gesellschaft environment. As part of this transition, they were moving away from silently listening to males and older members of the family toward speaking up and expressing their personal opinions. In other words, their views of gender roles and relations showed fundamental shifts in values relating back to an increase in independent behavior that occurred as they lived and worked in a more Gesellschaft environment.

Urban residence has an effect on cognitive as well as social development. Note in Figures 3.4 and 3.5 that not only schooling but also urbanization had an effect on equivalence grouping. In both graphs, the difference between unschooled bush children and schooled bush children is magnified when urbanization is added to schooling. Therefore, urban residence exerts its independent positive effect (i.e., independent from schooling) not only on diversifying the criteria for grouping similar items (see Figure 3.4) but also on an abstract approach to reasoning about equivalence (see Figure 3.5). Working in a small rural Mestizo village in Mexico and utilizing a similar task, Maccoby and Modiano (1966) also found a more concrete approach to reasoning in the village and a more abstract approach in Mexico City.

D. Technology

Among our Zinacantec Maya participants in Chiapas, we recently watched the technology of telephony create more social interaction at a distance, as men and boys became increasingly independent of their families in the course of commercial travel and trade and as women and girls "commuted" to a commercial venue in the city (Greenfield et al., 2009). The emphasis on interaction at a distance, rather than face to face, is one more way to create independence.

This process, of course, started much earlier and has gone much farther in the United States. I began to study the developmental impact of technology in the 1980s because, moving from the East coast to California, I perceived the dominance of media as a major change in my own cultural environment and as a predominant cultural influence on children growing up in Los Angeles, my new home. However, it was not until the distinguished cognitive psychologist Richard Neisser invited me to explain the Flynn effect (the worldwide rise in IQ performance) for a conference he was organizing that I connected the subject of technology with my research on social change. I decided to focus on cultural history as the key to the Flynn effect. As I reviewed and organized material for my explanation, I concluded that three sociodemographic factors were producing the Flynn effect worldwide: urbanization, education, and technology (Greenfield, 1998). Because technology was the most rapidly changing element of the three in the United States at that moment, it became the focus of my analysis.

Technology, like other components of a Gesellschaft world, enhances abstraction. It does so by utilizing and requiring representational processes in lieu of direct action and interaction. Radio, television, video games, and computers all require users to deal with a world that is represented through sound or on a visible screen. This world is more abstract (in the sense of being removed from the real world) than is direct interaction with the physical or social environment. In experimental and correlational research with both college students and children, we found that video games develop iconic representation and other visual–spatial skills such as mental paper folding (Greenfield, Brannon, & Lohr, 1994a; Greenfield et al., 1994b; Subrahmanyam & Greenfield, 1994). This pattern of findings has now been replicated in other laboratories (e.g., De Lisi & Wolford, 2002; Okagaki & Frensch, 1994). These are skills for dealing with the representations of objects and spaces rather than real-world objects and spaces.

One of our studies was cross-cultural, comparing university students in the United States with those in Italy (Greenfield et al., 1994b). In terms of sociodemographics, Italy provided a setting in which computer technology was less diffused among the general population at that time than in the United States (Sensales & Greenfield, 1991, 1995). To start the study, students in both countries were given a test in which they had to induce from animated demonstrations presented on a screen the logic of computer circuitry. A sample demonstration is shown in Figure 3.15, and a page from the test is shown in Figure 3.16. (Figure 3.15 demonstrates the answer to the question in Figure 3.16 regarding how one can get the orange color to flow through the game element.) We called this a test of scientific–technical discovery skills. We did not tell the participants how to represent their answers, and much to our surprise, some used diagrams (iconic representation), some used words, and some mixed the two kinds of symbol system (see Figure 3.17).

The test relied on the ability to understand an abstract scientific–technical representation; the representation was abstract because it was virtual. Experienced video game players and U.S. students did significantly better at this test than novice players or Italian students in Rome. Therefore, both specific experience with computer technology (in the form of video games) and generalized exposure (by virtue of the diffusion of computer technology in a particular country) had an impact on learning from the abstract screen-based representation (see Figure 3.18).

We can also think of iconic representation as a way of dealing with virtual rather than real objects. We found in this study that U.S. students, with their greater exposure to computer technology, used iconic representation in their test responses significantly more frequently than the Italian students did (see Figure 3.15).

Gesellschaft conditions also promote taking in information from multiple sources (Greenfield et al., 2003a). Technology has an important role in facilitating this development, because print, radio, television, computers, and the Internet provide many alternative sources of information, allowing and encouraging the user to go beyond family and other local sources of knowledge (Keller, 2007). On a more micro-level, video game play develops skill in processing information from more than one location in the visual field (Greenfield, deWinstanley, Kilpatrick, & Kaye, 1994c; Green & Bavelier, 2003). This kind of perceptual or attentional processing can be seen as a cognitive prerequisite to multitasking, an outgrowth of multiple channels of technologically mediated communication (Greenfield, 2009b).

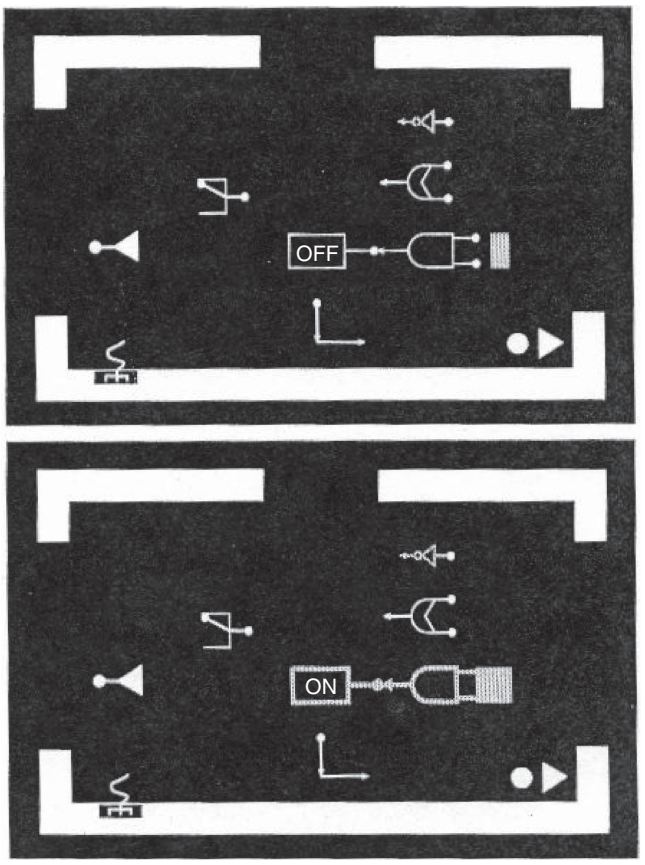


FIGURE 3.15: Sequence of two screens from the test of scientific–technical discovery. The two screens demonstrate a circuit being activated. Shaded areas, which were orange in the actual displays, represent the flow of power. The figure represents the activation of an ON/OFF indicator (middle element in both screens). The shaded quadrilateral in each screen represents a power source. The lollipop-shaped protuberances are input locations. The top screen shows the power source near an *and-gate* attached to an ON/OFF indicator. Electricity flows through an *and-gate* when a power source touches both its inputs. This can be seen in the bottom screen (expanded width of the shaded lines indicates the flow of power), where the ON/OFF indicator is being turned on. This indicator was off in the first screen, in which the power source was not touching the inputs. (From Greenfield et al., 1994b).

Video games train participants in technical skills that are adaptive in and adapted to a Gesellschaft world with its highly technical professions. For example, video game play enhances skill in laparoscopic surgery, undoubtedly through the development of visual spatial skills (Rosser et al., 2007). Video game play also enhances the carrying out of technical military tasks that must be monitored and engaged in simultaneously (Kearney, 2005).

NAME:

DATE: FORM B

What does this represent? 

What is its function?

How would you get the orange color to flow through the following game elements?

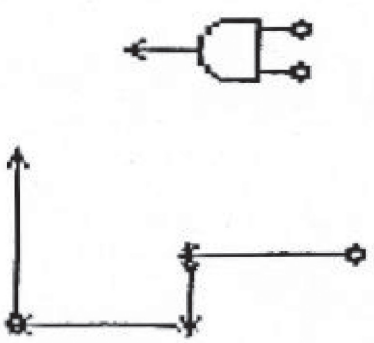


FIGURE 3.16: Sample questions from the test of scientific–technical discovery. The rectangle represents the power source. Both the power source and the flow of power were represented by orange in the screen displays of the functioning of electronic circuits, but are represented by shaded areas in Figure 3.15. (From Greenfield et al., 1994b).

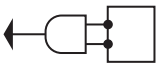
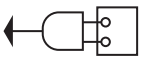
Verbal	I would touch both spurs with the energizer one is not enough.	
Iconic		
Mixed		Touch both simultaneously.

FIGURE 3.17: Different modes of representation used to answer the question of how one can get the power source to flow through the game element (see Figures 3.15 and 3.16). (From Greenfield et al., 1994b).

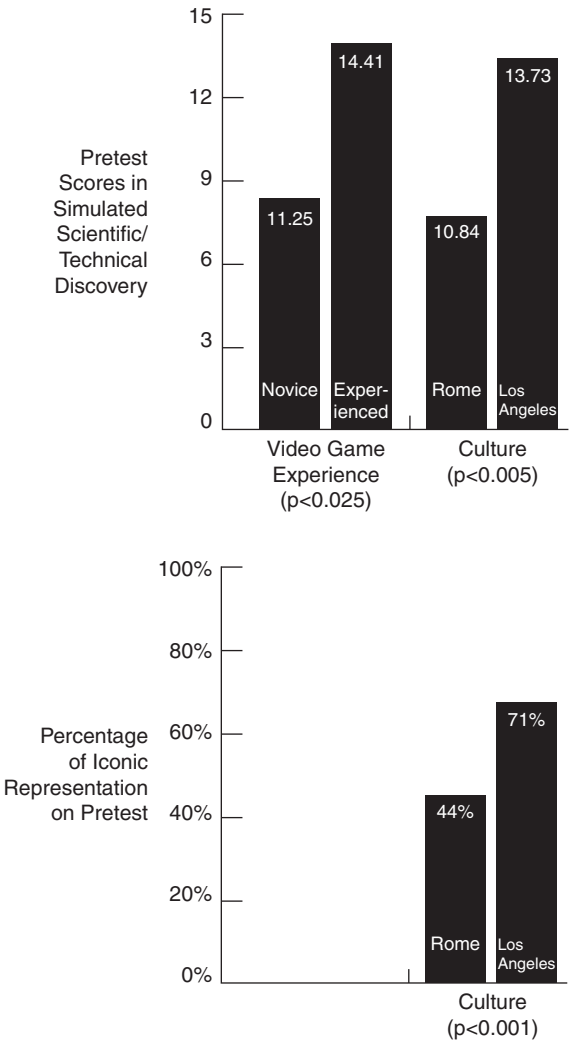


FIGURE 3.18: Significant long-term influences on simulated scientific–technical discovery and mode of representation. (From Greenfield et al., 1994b).

On the social level, the introduction of reading creates an individual who is more socially isolated—one must be alone to read, out of the range of social noise (Wober, 1967). One can think of reading as the beginning of the individualistic need for privacy. In Nigeria, the desire to read was empirically related to a desire for private living quarters (Wober, 1967); this desire for privacy is a component of the socially removed individual.

At the other extreme of technological development, our recent research with college students at Children's Digital Media Center @ Los Angeles revealed

that social network sites such as MySpace stimulate a rather narcissistic preoccupation with self-presentation (Manago, Graham, Greenfield, & Salimkhan, 2008; Salimkhan, Manago, & Greenfield, 2010). Videotaped tours of students' MySpace profiles revealed that visual images and multimedia become integrated in the sense of self as the line between advertisement and self-promotion disappears (Salimkhan et al., 2010). Focus groups with college students suggested that awareness of a large audience (with social networks of "friends" typically in the hundreds) can favor narcissistic preoccupation with self-presentation (Manago et al., 2008).

Indeed, communication technology has advanced and become part of everyday life in the last decade. An analysis of 50 years of popular preteen television programming showed that, in the last decade, preteen television has become obsessed with the narcissistic value of fame (Uhls & Greenfield, 2011). A further study showed that fame is now the number 1 motive for preteen children (Uhls & Greenfield, in press). Correlated with the sudden importance of fame, the main sociodemographic change in this period has been the development and expansion of personal communication technologies, so this is the most likely sociodemographic causal factor. Corroborating these findings on the behavioral level, surveys of college students over the last decades have shown ever-increasing levels of narcissism (Twenge, Konrath, Foster, Campbell, & Bushman, 2008), with a sudden drop in the last decade in the Gemeinschaft-adapted value of empathy (O'Brien, Hsing, & Konrath, 2010).

Along with the cell phone, the technology of social network sites has had another impact closely related to the movement of society in ever more Gesellschaft directions: The use of these media has decreased the importance of family relations compared to relations with unrelated peers (Ling & Yttri, 2006). It has also increased the number of "friendships" dramatically, increasing the number of friends who are communicated with through technological mediation and thus moving users ever farther from the face-to-face contact for which human beings are evolutionarily adapted and which is paramount in a Gemeinschaft environment.

E. Immigration

Thus far, I have considered social change in the Gesellschaft direction among children and families who have remained in their country of origin. I now move to research that evolved in response to the global trend of immigration from a more Gemeinschaft to a more Gesellschaft environment, usually with an explicit motive of going to a country with more economic and educational

opportunity—that is, more Gesellschaft conditions. Our team has done research on the intergenerational value changes that occur in this situation. We found that children from Latino immigrant families (mainly Mexican in origin) growing up in the United States become more individualistic in their values, compared with their parents, in a number of different domains (Greenfield & Quiroz, 2011; Raeff et al., 2000). Similar cross-generational findings were brought to light in the ethnographic research of Delgado-Gaitan (1994) with Latino immigrant families in Carpenteria, California; she found that familistic practices declined in the socialization provided by second-generation parents, especially in the school domain.

Applying Berry's (1997) scheme of the four different trajectories that can result from immigration—marginalization in two cultures, integration of two cultures, separation from the national culture, and assimilation into the national culture—our research in a Latino immigrant community in Los Angeles indicated that, in the family domain, separation is the dominant mode for both Latino immigrant parents and their children (i.e., Latino families hold significantly more familistic values than do European American parents or teachers from a variety of ethnic groups). In contrast, both Latino immigrant parents and their children assimilate to the dominant individualistic culture in the school domain. However, we also had some indication that Latino immigrant parents transfer familistic values to a school situation to a greater degree than their children do. In essence, lumping of immigrants into one of Berry's four categories misses the domain-specific adaptations that our research has uncovered.

Immigrating from a more Gemeinschaft to a more Gesellschaft environment also involves another change, that of movement from a more ethnically homogenous to a more ethnically heterogeneous environment. This situation can lead to cross-cultural value differences and consequent misunderstandings. We carried out a study to explore this issue with multiethnic high school sports teams in Los Angeles. These teams had many immigrant Asian and Latino players, a situation that led to heterogeneity of values (Greenfield, Davis, Suzuki, & Boutakidis, 2002; Kernan & Greenfield, 2005)—that is, to multiple perspectives, a condition identified as resulting from social change in Maya Chiapas (Manago, in press). Often, the multiple perspectives caused conflict and misunderstanding (Greenfield et al., 2002; Suzuki, Davis, & Greenfield, 2008). The main source of conflict on the girls' teams was the fact that some players approached practices and games with collectivistic assumptions, whereas others approached them with individualistic ones.

Another common situation illustrating ethnic heterogeneity occurs when nannies and parents come from different cultures. This situation has the potential to lead to conflicts in childrearing values and practices (i.e., the child's learning environment) (see Figure 3.1). Very often, cross-cultural nannies have immigrated from a more Gemeinschaft to a more Gesellschaft environment. We performed a qualitative discourse study of nanny–mother pairs in Los Angeles (in which the nannies were all Latina immigrants). As predicted by the theory, sociodemographic discrepancy between mother and nanny, notably in level of formal education, produced discrepancies in values and practices in which one member of the pair expressed a value or engaged in a child care practice that was more adapted to Gemeinschaft conditions, while the other expressed a value or engaged in a practice that was more adapted to Gesellschaft conditions (Greenfield, Flores, Davis, & Salimkhan, 2008). Usually, but not always, the nanny's value or practice was more Gemeinschaft adapted and the mother's was more Gesellschaft adapted.

As the theory posits, sociodemographic differences trumped ethnic differences in producing these discrepancies in both cultural values and the practices constituting the infant's learning environment (Greenfield et al., 2008). Examples of these differences include prioritizing family responsibility (Gemeinschaft adaptation) versus prioritizing personal accomplishment (Gesellschaft adaptation) and prioritizing interdependence (Gemeinschaft adaptation) versus prioritizing independence (Gesellschaft adaptation). In line with the concept of tolerating differences that comes with the multiple perspectives of an urban environment (Manago, in press), however, we also found explicit positive recognition of cross-cultural learning between nanny and employer.

V. APPLICATIONS

My theoretical framework and empirical research on immigrant Latino families and their schools has generated applications at the individual, family, and community levels. This body of research identified a situation of cross-cultural value conflict between immigrant parents and their children's schools. We did a study utilizing scenarios that presented everyday social dilemmas that could be resolved in either an individualistic way or a familistic/collectivistic way. Latino immigrant parents, whose relatively Gemeinschaft backgrounds were indexed by the fact that their average level of schooling was fifth grade, resolved these dilemmas in a more collectivistic direction (e.g., sharing and helping as a matter of social obligation), whereas teachers resolved them in a more

individualistic direction (e.g., respecting individual property, focusing on task achievement, and acting by individual choice rather than on the basis of family or social responsibility) (Raeff et al., 2000). Our ethnography and discourse study of parent–teacher conferences indicated that such differences cause observable value conflicts and cross-cultural misunderstandings between Latino immigrant parents and teachers or administrators in their children's elementary schools (Greenfield, 2006; Greenfield, Quiroz, & Raeff, 2000).

The responses of fifth-grade children to some dilemmas involving home and family indicated that they were following their parents' familistic values; their responses to other family-relevant dilemmas were both less familistic than those of their parents and less individualistic than those of their teachers (Raeff et al., 2000). When the dilemmas dealt with a school situation, however, the responses of the children sometimes indicated that they were adopting their teachers' values and abandoning home values.

Our Bridging Cultures Project was originally designed to make teachers aware of the two cultures—a more collectivistic/familistic culture adapted to a Gemeinschaft environment and a more individualistic culture adapted to a Gesellschaft environment (Greenfield, 2006; Trumbull, Rothstein-Fisch, & Greenfield, 2000b; Trumbull, Rothstein-Fisch, Greenfield, & Quiroz, 1998). We began by communicating our research on cross-cultural value conflict between Latino immigrant parents and school personnel to teachers in bilingual Spanish–English classrooms whom we had recruited for a series of Bridging Cultures professional development workshops. From there, we had the teachers look for and observe such situations in their own schools, and the workshop group discussed their observations. Finally, we asked the teachers to make changes to alleviate the observed conflicts. In essence, this last assignment of the initial workshops started the teachers on a journey of creating their own techniques for curriculum, classroom management, and parent relations that would reduce the cross-cultural value conflict experienced by these families (Rothstein-Fisch & Trumbull, 2008; Trumbull et al., 1998).

The project has been very successful and has been widely disseminated on local, regional, and national levels (Trumbull, Diaz-Meza, Hasan, & Rothstein-Fisch, 2000a), where its major impact has been in the preservice and inservice education of teachers. We ourselves have used the framework, not only to provide professional development for teachers but also to provide parent education concerning the two sets of cultural values. In a small experimental study in which participants were randomly assigned to one of two intervention groups, we found that workshops utilizing the Bridging Cultures paradigm

concerning cross-cultural value differences (but not standard parent workshops focusing on homework help) led to increased communication of parents with their children's teachers, greater understanding of the individualistic school culture, and enhanced relationships between parents and their children growing up in a bicultural environment (Esau, Daley, Greenfield, & Robles-Bodan, in press).

Most recently, we extended this theoretical framework to provide workshops to immigrant adolescents from Central America who have experienced long-term separations from their families in the course of the immigration process. In these situations, the parents immigrated first but were able to send for their children only years later. We found that the main issue exacerbating the disruption of attachments that this difficult experience engendered was parents' lack of explicit verbal communication to their children about impending separation and the separation experience. Whereas implicit communication is effective in a Gemeinschaft environment in which family members share time and space, it does not work under the more Gesellschaft conditions of long-term or regular separations when time and space cannot be shared. When both parents and their adolescent children participated in our workshops, parent–child communication, using the verbal modality, was greatly enhanced (Greenfield, Espinoza, Monterroza, & Manago, manuscript in preparation).

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VI. EXTENSIONS AND FUTURE DIRECTIONS

This program of research is still actively evolving. I conclude by describing four extensions and future directions. One is the extension to empirical work in other countries, notably the work of graduate student Heejung Park comparing urban Korean families with urban European-American Angelinos, rural Koreans, and Korean American immigrants. Park (2011) is using sophisticated sociodemographic analysis to debunk the myth that ethnicity is the dominant determinant of cultural values; for example, she has found no differences between urban middle-class Koreans in Seoul and urban middle-class European Americans in Los Angeles on individualistic and collectivistic cultural values.

The second extension speaks to the special relationship of adolescents to social change. Working in Chiapas, Adriana Manago has identified adolescence as the developmental stage most responsive to sociodemographic change. Her articles and dissertation will shed light on how adolescents respond to new opportunities for formal schooling and migration to the city by constructing new values and new forms of social life (Manago & Greenfield, 2011; Manago,

in press; Manago, 2011). We are now in the planning stages, in collaboration with Michael Weinstock to study social change and adolescent development in a Bedouin population in Israel.

A third extension is the consideration of the effects of sociodemographic movement in the opposite direction, toward more Gemeinschaft conditions. The present economic downturn provides an opportunity to observe whether values, learning environments, and human development also turn toward more Gemeinschaft adaptations. So far, I have evidence from newspaper reports that this may indeed be happening. I would like now to test this prediction from my theory through systematic data collection.

Finally, my research is being extended in a direction that has been planned for the last 20 years: a return to Chiapas to collect data on the next generation of Nabenchauk families. This time I will be joined by my former student and collaborator, Ashley Maynard, who herself has collected longitudinal data on sibling and cousin interactions in Nabenchauk and the influence of commerce development on these interactions (Maynard, 2002). Our study will constitute the first test for one of the cornerstones of the theory: that each sociodemographic dimension can push learning environments and developmental pathways in the same direction. Whereas commerce was the major sociodemographic transformation between the first and second waves of data collection, urbanization and formal education are the major changes since the 1990s. We expect the developmental pathway to keep moving in the same direction, toward independence, abstraction, and the value of novelty; however, we also expect that the main causal factors will shift from commercial activity to urban living and increased levels of formal education. Thus, this study of Generations 3 (parents) and 4 (children) provides a unique opportunity to test a cornerstone of the theory: that whatever factor is changing most rapidly in the sociodemographic environment will be the driver of that epoch's changes in learning environments and developmental pathways.

VII. CONCLUSION

The Theory of Social Change and Human Development has important implications for the interrelation of culture and psychology. The theory provides a way of understanding the psychological and developmental implications of the massive social changes occurring around the world. It allows the field to move away from the fiction that cultures are forever the same and to integrate new insights about social change into empirical research. It also helps move culture and psychology into a more mature theoretical stage in which

theory-based predictions can be made about the effects of particular kinds of social change on human development and human psychology.

The theory is not tied to any one methodology nor any one branch of psychology; as a consequence, it is usable not only by developmental researchers but also by researchers from social psychology, clinical psychology, and cognitive psychology who wish to explore the relationship between culture and psychology in innovative new ways. The theory can also guide the work of anthropologists who might want to approach the issue of culture change through cross-generational ethnography and sociologists who might want to do so through surveys administered across time.

The goal is for the theory to make a step toward integrating across disciplines as well as across subfields within psychology. The hope is that all cultural and cross-cultural researchers will come to understand that: (1) culture is, from the historical perspective, a moving target; and (2) cultural trajectories begin at birth: the adults studied by cognitive, social, and clinical psychologists represent the outcome of cultural pathways through socialization and development.

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