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# Social change, cultural evolution, and human development

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Social change has accelerated globally. Greenfield's interdisciplinary and multilevel theory of social change and human development provides a unified framework for exploring implications of these changes for cultural values, learning environments/socialization processes, and human development/behavior. Data from societies where social change has occurred in place (US, China, and Mexico) and a community where it has occurred through international migration (Mexican immigrants in the US) elucidate these implications. Globally dominant sociodemographic trends are: rural to urban, agriculture to commerce, isolation to interconnectedness, less to more education, less to more technology, lesser to greater wealth, and larger to smaller families/households. These trends lead to both cultural losses (e.g., interdependence/collectivism, respect, tradition, contextualized thinking) and cultural gains (e.g., independence/individualism, equality, innovation, abstraction).

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**Current Opinion in Psychology** 2016, 8:84–92

This review comes from a themed issue on **Culture**

Edited by **Michele Gelfand** and **Yoshi Kashima**

<http://dx.doi.org/10.1016/j.copsyc.2015.10.012>

2352-250/Published by Elsevier Ltd.

Social change has accelerated in the world. Ordinary people are aware of these changes and have folk theories concerning the behavioral ramifications of social change [1\*,2]. Greenfield's theory of social change, cultural evolution, and human development provides a unified framework for exploring the cultural and psychological implications of these changes, complementing folk theories with other kinds of psychological evidence [3\*,4]. This is a multilevel and interdisciplinary theory incorporating sociological variables at the top level (with roots in Tönnies [5]), cultural variables at the next level down, and more traditional psychological variables at the next two levels (Figure 1).

According to this theory, as the world becomes more urban, formally educated, commercial, richer, interconnected, and technological, with smaller families and

households (the dominant direction of social change in our globalizing world) cultural values, learning environments (i.e., socialization processes) and human development/behavior shift in predictable ways to adapt to the new conditions (e.g., [6\*] and Figure 2).

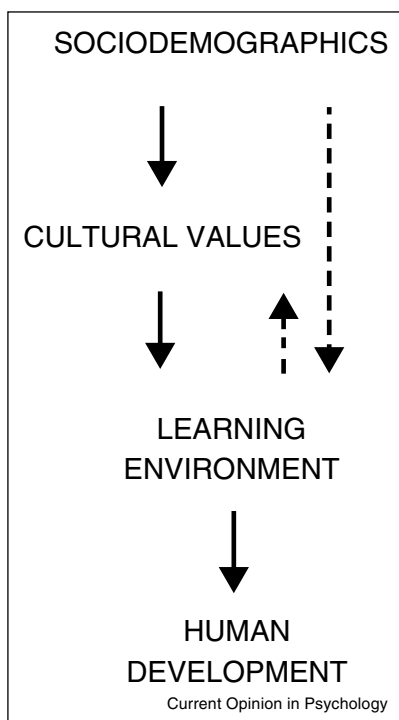
On the cultural level, these sociodemographic changes move values from more collectivistic (family-centered, community-centered, or nation-centered) to more individualistic (e.g., [7,8,9\*,10]). Adapting to new conditions, cultural values for social relationships shift from hierarchical to egalitarian gender relations, from ascribed to chosen gender roles, and from giving to others to getting for oneself; the importance of materialism and fame rises [11]. Values adaptive in agricultural communities, such as obedience and age-graded authority, decline in importance, as child-centeredness increases [12\*–15]. Preferred thinking processes shift from tradition to innovation, from contextualized cognition to abstraction [15,16\*]. In metacognition, values shift from one correct perspective to multiple perspectives [14,17\*] (Figure 2).

At the next level down, value changes are reflected in new socialization practices and learning environments that foster the behavioral expression of these values: a movement from socially guided learning to independent learning [15,18]; from more bodily contact between mothers and infants to more physical separation [19]; from criticism as a way to bring others up to a social standard to praise as a way to foster self-confidence [20]; to support and warmth as important socialization practices (C Zhou, Yiu, Wu, Lin, & Greenfield, unpublished data) [21]; from expectations of family obligation to expectations of individual development [22]; from in-person social interaction to technologically mediated social interaction [9\*] (Figure 2).

These changes in the learning environment in turn lead to new patterns of behavioral development, in other words: altered psychologies. In the social domain, adaptive behavior goes from obedient to independent [15] (C Zhou, Yiu, Wu, Lin, & Greenfield, unpublished data), from respectful to self-expressive and curious (C Zhou, Yiu, Wu, Lin, & Greenfield, unpublished data) [23]. In the cognitive domain, processes go from detail-oriented to abstract, from tradition-based to novel [15,16\*] (Figure 2). The bottom rectangle of Figure 2 summarizes other developmental and behavioral shifts that will be discussed later as part of the four case studies.

A novel feature of the theory (illustrated later in the Maya Mexican case), is that each sociodemographic factor is equipotential. Whatever factor or factors is/are changing

Figure 1



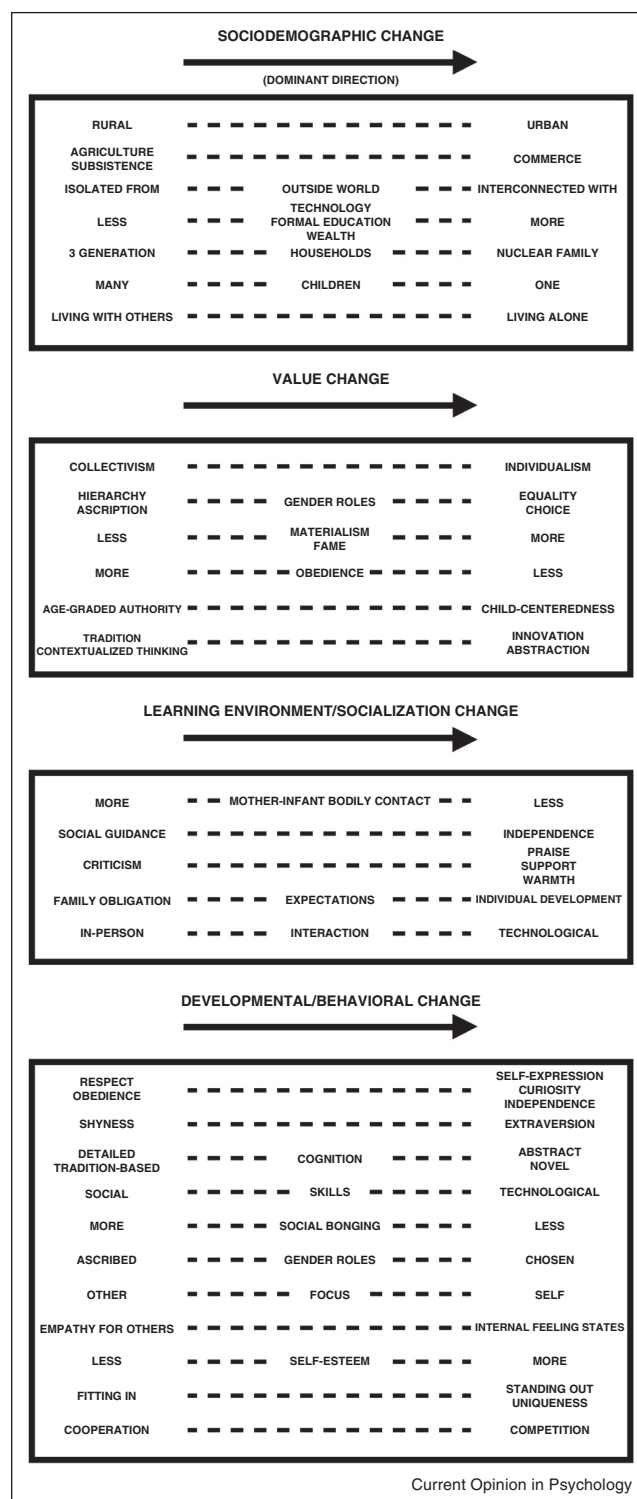
A multilevel model linking sociological, cultural, environmental, and behavioral variables. Solid arrows denote the main causal pathway, with dashed arrows indicating an alternative causal pathway.

most rapidly will drive cultural and psychological change in a particular time or place.

In order to show the interrelation of multiple levels (depicted by the vertical arrows in Figure 1), four case studies will be presented. Their variety illustrates an important fact: social change is pervasive in the world; it is not limited to so-called developing countries. Nor is it limited to social change that occurs in one's place of birth: around the world, people move from poorer to wealthier societies, from rural to urban environments, from places with little opportunity for formal education to places with more, from low tech environments to high-tech environments. Hence the theory can apply to migration situations. Three of the four case studies relate to social change in place: The United States, China, and the Maya of Chiapas. One relates to migration: Latino immigration from Mexico and Central America to the United States.

But societies and migrant populations also have their discrepancies, dialectics, and disconnects in the process of adapting to social change — for example, a discrepancy between behavior and values, with shifting values sometimes leading corresponding shifts in the learning environment, and altered learning environments sometimes leading corresponding shifts in values [24\*,25]. For in-

Figure 2



Model of social change, cultural evolution, and human development. Relationships for which there is empirical evidence, described in the text, have been selected for inclusion. While the horizontal arrows represent the dominant direction of social change in the world, sociodemographic change can go in the opposite direction [52\*]. In that case all the horizontal arrows would be reversed.

stance, Thein-Lemelson discusses a case in rapidly changing Burma/Myanmar, a country emerging from global isolation and moving into a market economy. In this particular family, the father verbally espouses independence as a developmental goal for his daughters; yet his six-year-old daughter was considered too young to brush her own teeth [24\*]. Here the father's values have shifted before they are supported by changes in the home learning environment. On the other hand, Thein-Lemelson describes the opposite situation: a Burmese mother verbally supports developmental goals adaptive in Burma's highly controlled and predominantly agricultural economy, such as understanding age-based hierarchy and respect for authority; yet her son's urban private elementary school, a product of the emerging market economy, emphasizes the developmental goal of independence, with socialization practices that lead to the boy's independent behaviors at home — such as washing his own face. Here a learning environment at school adapted to the newly privatized economy, and resulting independent child behavior at home, is paired with unchanged parental values.

Dialectical processes also occur in social change: Chen notes the directionality of global social change toward the coexistence and integrations of diverse value systems (e.g., individualistic and collectivistic) [26]; Hong and colleagues focus on multicultural identities [27]; and Chiu and Kwan discuss simultaneous encounter with symbols

of more than one culture [28]. Disconnects are frequent in the process of migration [29,30]; for example, return migrants from individualistic countries such as Australia find that they must readjust to contrasting cultural practices in their native Hong Kong — for example, education by effortful memorization in Hong Kong compared with the independent exploration found in the learning environments of Australian education [30].

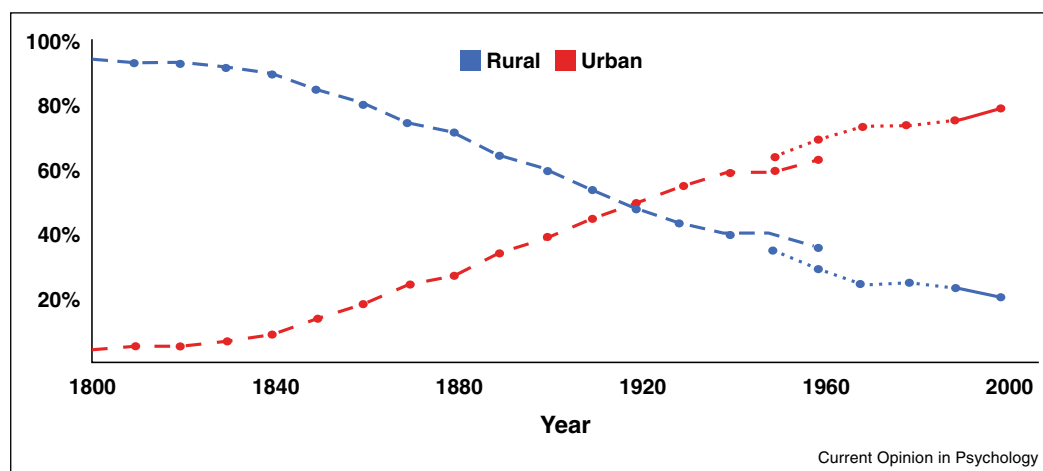
Although not acknowledged by classical modernization theory (e.g., [31]) sociodemographic trends are bidirectional — for example, not just from poor to wealthy, but also from wealthy to poor; the theory predicts that changes in culture, learning environments, and psychology are correspondingly bidirectional; a study of social change in the United States (noted in the next section) tests this prediction. Also unlike classical modernization theory, the theory of social change and human development considers cultural losses as well as cultural gains — for example, as individual independence grows over time, family closeness diminishes (e.g., [15]).

## The United States

### Sociodemographic change and cultural change

As an index of long-term sociodemographic change in the United States, the proportion of urban population in the United States rose steadily between 1800 and 2000 [12\*] (Figure 3). Between the late 1800s and the 2000s, family size and multigenerational households declined in fre-

Figure 3



Percentage of U.S. population living in rural and urban areas from 1800 to 2000. The data sources for the graph in Figure 3 were as follows: 1800–1980 (U.S. Census Bureau, 2004); 1990 (U.S. Bureau of the Census, 1992); 2000: (U.S. Census Bureau, 2004). The operational definition of urban population used through 1960 was people 'living in incorporated places of 2500 inhabitants or more and in areas (usually minor civil divisions) classified as urban under special rules relating to population size and density' (U.S. Census Bureau, 1953, p. 9). The definition introduced in 1950 was: 'all persons living in (a) places of 2500 inhabitants or more incorporated as cities, boroughs, and villages, (b) incorporated towns of 2500 inhabitants or more incorporated as cities, boroughs, and villages, (c) the densely settled urban fringe, including both incorporated and unincorporated areas, around cities of 50,000 or more, and (d) unincorporated places of 2500 inhabitants or more outside any urban fringe' (U.S. Census Bureau, 1953, p. 9). As seen in the graph, the Census Bureau used both definitions in 1950 and 1960, allowing one to see how they relate to each other. In 2000, the definition changed to densely settled territory, termed urbanized areas and urban clusters. In all definitions of urban, the remaining population is considered rural.

Figure and caption reproduced from Greenfield [12\*].

quency, as single-child families and living alone became more frequent family and household structures [32\*\*].

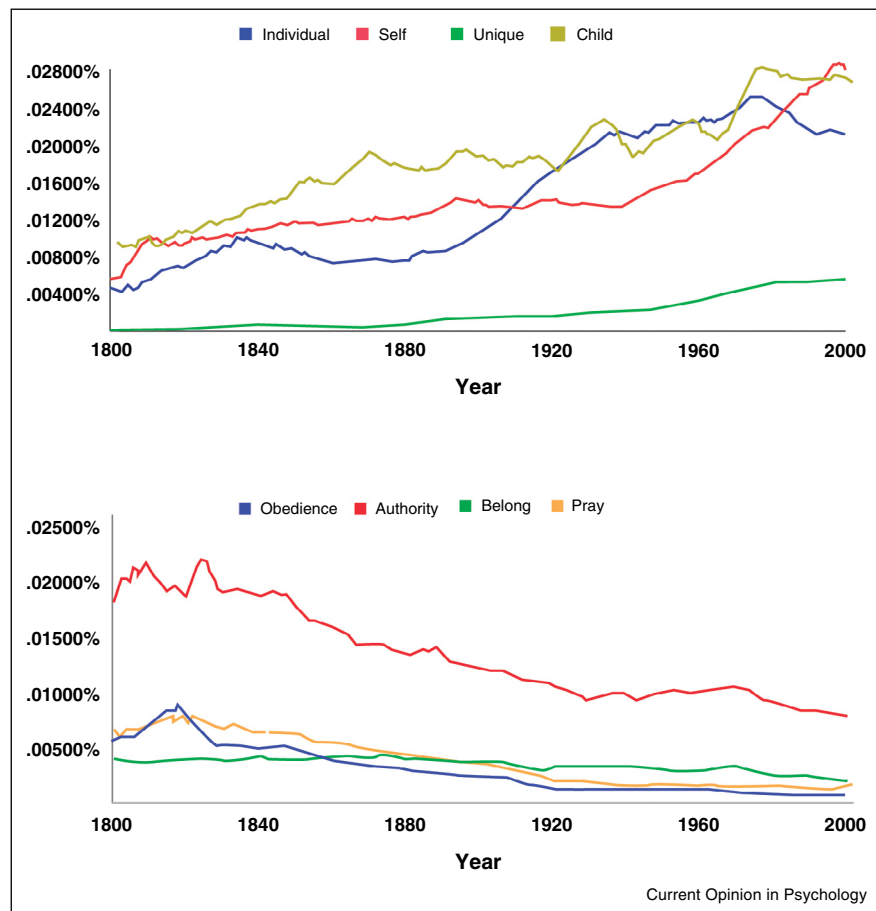
On the cultural level, content analysis of millions of books, using the Google Ngram Viewer, showed that, simultaneous with these sociodemographic shifts, individualistic words (e.g., *choose, personal, individual, self, unique, special*), first-person singular pronouns (e.g., *I, me, mine*), unique children's names, and the word *child* itself (indexing a rise in child-centeredness) also rose. In this same period of time, collectivistic words (e.g., *duty, give, harmony, belong, compassion*), first-person plural pronouns (*we, us, ours*), words signifying hierarchical social relations (*obedience, authority*), and words related to the practice of religion in everyday life (*pray, worship*) also became less frequent [12\*,32\*\*–36\*\*]. Figure 4 shows examples of these trends. Another individualistic cultural trend, the promotion of equal rights in the realm of gender, was manifest in a rising proportion of female

pronouns relative to male pronouns in books between the 1960s and the 2000s [37\*].

#### Change in cultural values, learning environments and human development/psychology

In line with the rise in individualistic content and the decline of collectivistic content in books, the content of the two most popular preteen television shows for each decade from the 1960s to the 2000s changed drastically in the values they manifest: community feeling declined as a value as fame and wealth rose [11]. A survey of 9–15-year-olds showed that individualistic, self-focused aspirations, such as fame, were tied to watching TV, as well as to actively using a social networking site, a recipe for the narcissism that is part and parcel of the fame motivation. In contrast, collectivistic, other-focused aspirations were associated with older nontechnology activities, most of which were intrinsically social [38\*].

Figure 4



Top panel: Increases in frequency of words indexing adaptation to more urban, educated, wealthy, and technological environments in the United States from 1800 through 2000. Bottom panel: Decreases in frequency of words indexing adaptations to more rural, less educated, poorer, and less technological environments from 1800 through 2000.

Figure from Greenfield [12\*].

These and other studies support a key theoretical idea: that communication technologies develop individualistic behaviors, attitudes, and values [39]. In-person social interaction not only develops social motivations; it also develops social skills, such as skill in reading the emotions of others [40\*]. Compared with communicating by means of technology, communicating with another person face to face maximizes the sense of bonding between friends [41\*].

Many other kinds of psychological shifts occurred as the United States became wealthier, more urban, more well educated, and more technological. Children, early adolescents, high-school students, and college students increased in self-esteem and positive self-views between the 1960s and the 2000s [42–45]; increasingly, they favored self-enhancement values such as money, fame, and image [46]. At the same time, communal traits such as empathy have declined [47], while the importance of internal feeling states increased [48]. Reflecting individualism in the domain of gender, there has been historical movement in the United States from ascribed roles of wife and mother to chosen roles in the domains of education and career, as well as increasing freedom from the constraints of marriage and sexual fidelity [49\*–51].

#### *Reversing these trends*

However, the theory also predicts that reversing sociodemographic trends, for example, wealth reduction, will reverse cultural and psychological trends. In line with this prediction, yearly national surveys of college students from 1976 to 2010 showed that concern for others and for the environment were higher during times of relative economic deprivation, while materialism and positive self-views were higher in better economic times. With respect to positive self-views, the Great Recession was an historical exception, probably because of conflicting sociodemographic trends: the increasing role of technology seemed to overwhelm reduced economic level; and self-views continued to become more positive, even as concern for others and for the environment rose [52\*].

## **China**

### **Sociodemographic change and cultural change**

On the cultural level, as China rapidly developed a market economy, individualistic pronoun use (first-person singular) and individualistic verbs, adjectives, and nouns (e.g., *choose, private, freedom, and rights*), as well as lexical indicators of materialism (e.g., *get*), became more frequent in the thousands of Chinese books analyzed by the Google Ngram Viewer [53\*,54\*,55]. As predicted by Greenfield's theory, increases in this period were significantly correlated with national increases in wealth, level of formal education, and urban population [53\*]. Also as predicted on theoretical grounds, collectivistic pronoun

use (first-person plural) and some collectivistic nouns and verbs declined in the same period (e.g., *help, sacrifice*) and the frequency of these words was negatively correlated with national increases in wealth, level of formal education, and urban population. At the same time, the incredibly rapid social change that China has undergone was reflected in a collectivistic reaction, so that some collectivistic words (*obliged, give, family*) increased in frequency, a situation indicating the simultaneous presence of two value systems [53\*,26].

### **Socialization change and developmental change**

These sociodemographic and cultural changes are also reflected in child socialization and development. On the level of socialization, grandmothers (who raised their own children and are now actively involved with their grandchildren) remember being parented more critically and with less praise and support than their grandchildren are being parented (C Zhou, Yiu, Wu, Lin, & Greenfield, unpublished data). They also recall themselves as significantly more obedient than their own children during childhood, and their own children as significantly more obedient than their grandchildren. Also as expected, they see their grandchildren as more autonomous, extraverted, curious, and self-expressive than their own children were during childhood, and their own children as having been more autonomous, extraverted, curious, and self-expressive than they themselves were as children.

In line with grandmothers' perceptions of social change, child surveys, teacher observations, and school records reveal that shyness used to be a positive trait in Chinese children (associated with social and academic achievement). But because extraversion is now more adaptive than shyness in the environment of a market economy, shyness has come to be associated with maladjustment (peer rejection, school problems, and depression) [56\*\*]. Not only actual social change, but parental perceptions of social change can have an impact on socialization. The reports of Chinese adolescents that their parents were warm and encouraging of independence were correlated with their parents' perceptions of social change in terms of new opportunities and prospects [21].

## **Mexico**

### **Sociodemographic change and cultural change**

In Zinacantec Maya communities in highland Chiapas, woven and embroidered patterns went from uniform tradition to individual innovation, as the economic foundation of the community moved from subsistence and agriculture to money and commerce [15]. The Tzotzil Maya word for 'different' went from a negative to a positive, showing that fitting in became a less important value, while individual uniqueness became more valued. As the economy became more commercial, the learning

environment of informal education also shifted: weaving learners shed their reliance on interdependence with their informal teachers; they became increasingly independent learners [18]. In the cognitive domain, children became less detail-oriented and more abstract in their representation of familiar woven patterns, while getting more skilled at representing novel patterns [16\*]. While abstraction is clearly valued in a *Gesellschaft* world, the decline of detailed representations represents a loss of the kind of representation needed to weave the patterns, a skill central to Maya cultural traditions.

Between Generation 1 (studied in 1969 and 1970) and Generation 2 (studied in 1991) cognitive changes were mainly fueled by economic shifts from subsistence and agriculture to commerce and money. However, between Generation 2 and Generation 3 (studied in 2012), continuing cognitive changes in the same direction were mainly fueled by increased schooling [16\*]. In each case, the critical sociodemographic variable was the one that was changing most rapidly during that period of time. Simultaneously, detailed representation of woven patterns (such as one would need to weave them) was negatively affected by the loss of weaving experience, as learning to weave was replaced by going to school.

Looking at the same three generations in a cross-sectional design, Manago found that the development of commerce impelled changing gender-role values (from hierarchical to egalitarian and from ascribed to chosen) from grandmothers to mothers, whereas formal schooling further advanced the changes between mothers and their teenage daughters [57,58\*\*]. In a study of first generation Maya university students, Manago found that the transition from homogenous village to diverse city brought with it a metacognitive shift from one correct way to multiple perspectives [14].

Similar sociodemographic change was observed in Baja California from the 1970s to the 2000s and in Veracruz from the 1980s to the 2000s. Comparing children tested in the two periods, researchers found that child behavior moved from highly cooperative to quite competitive as communities became more urban and commerce-oriented [59\*].

#### **Immigrants from Mexico and Central America to the United States**

Immigrants from Mexico and Central America have transitioned from poorer countries to a wealthier one, from less educational opportunity to greater educational opportunity, and (often) from rural to urban environments. As one would expect on theoretical grounds, they bring with them a collectivistic perspective that may even be strengthened in their immigrant communities [60]. As a consequence, their values conflict with the individualistic

values that dominate in the United States, for example in American schooling [61\*]. Therefore, children from Latino immigrant families are exposed to two conflicting sets of values: family oriented collectivism at home and individualism at school. This value mismatch becomes even more severe at the college level, where individualistic academic obligations are so much more demanding, making it more difficult to fulfill the family obligations that are at the heart of Latino collectivism [62\*]. In a diverse university, first-generation Latino college students from immigrant families face similar value mismatches with other-ethnic peers from more well-educated families [63].

#### **Conclusions and future directions**

At the extreme, the sociodemographic conditions on the left-hand side of Figure 2 approach the conditions in which the human species evolved. In that sense, they are fundamental to human life. However, equally fundamental to human life are capacities and propensities to adapt to shifting conditions, yielding the altered cultural values, learning environments, and behavioral developments we see on the right side of Figure 2. Yet, unlike classical modernization theory, we must not see the effects of the dominant direction of social change as pure progress; instead, we must be aware that every shift toward the right-hand side of Figure 2 in values, learning environments, and behaviors, brings a loss of the corresponding values, learning environments, and behaviors on the left side of the figure, for example, a loss of traditional values, social guidance, family obligation, and respect. Future research should explore these losses, which have up to now received far too little attention.

It is clear that, in today's world, social change has become more normative than social stability. Greenfield's theory of social change and human development has successfully predicted the consequences of social change around the world. It provides a generative framework for further exploration of social change, cultural evolution, and human development; in turn, continued empirical investigation will further enrich the theory [3\*\*,4]. From a methodological perspective, the body of literature reviewed in this article implies that the concept of replicability as the gold standard for psychological research needs to be replaced by an understanding that failure to replicate a study may be the mark of social change rather than a mark of unreliable data [59\*].

#### **Conflict of interest statement**

Nothing declared.

#### **Acknowledgements**

Many thanks to Goldie Salimkhan for drawing Figure 2 and modifying Figure 1; and to Darby A Tarlow for organizing the reference list and drafting annotations.

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33. Twenge JM, Campbell WK, Gentile B: **Increases in individualistic words and phrases in American books, 1960–2008**. *PLoS ONE* 2012, **7**:e40181.
34. DeWall CN, Pond RS, Campbell WK, Twenge JM: **Tuning in to psychological change: linguistic markers of psychological traits and emotions over time**. *Psychol Aesthet Creativity Arts* 2011, **5**:200-207.
35. Kesebir P, Kesebir S: **The cultural salience of moral character and virtue declined in twentieth century America**. *J Posit Psychol* 2012, **7**:471-480.
36. Twenge JM: **The age in which we live and its impact on the person**. In *Psychology of Change: Life Contexts, Experiences, and Identities*. Edited by Reynolds KJ, Branscombe NR. New York, NY: Psychology Press; 2015:44-58.
- This is a comprehensive and up-to-date summary of Twenge and colleagues important and pioneering set of cross-temporal studies of the social psychological ramifications of social change.
37. Twenge JM, Campbell WK, Gentile B: **Male and female pronoun use in U.S. books reflects women's status, 1900–2008**. *Sex Roles* 2012, **67**:488-493.
- The authors analyzed the complete text of almost 1.2 million United States books from the Google Books database to determine whether shifts in written language, especially the ratio of male to female pronouns, reflected trends in the status of women in the period between 1900 and 2008. The ratio of male to female gender pronouns correlated significantly with markers of American women's status such as participation in the labor force, level of education, and age at the time of the first marriage, as well as women's assertiveness, a trait linked to increased status.
38. Uhls YT, Zgourou E, Greenfield PM: **21st century media, fame, and other future aspirations: a national survey of 9–15 year olds**. *Cyberpsychology* 2014, **8** (article 5).
- A nation-wide survey questioned children ages 9–15 about their future aspirations and their media consumption to determine how media usage is related to the development of individualistic and collectivistic values. Social network use and television watching each predicted self-focused aspirations, while both media together predicted a larger portion of the variance than either alone. Nonmedia activities, mainly of a social nature, were linked with other-focused aspirations.
39. Gentile B, Twenge JM, Freeman EC, Campbell WK: **The effect of social networking websites on positive self-views: an experimental investigation**. *Comput Hum Behav* 2012, **28**:1929-1933.
40. Uhls YT, Michikyan M, Morris J, Garcia D, Small GW, Zgourou E, Greenfield PM: **Five days at outdoor education camp without screens improves preteen skills with nonverbal emotion cues**. *Comput Hum Behav* 2014, **39**:387-392.
- A field experiment examined whether preteens were more capable at recognizing nonverbal cues when opportunities for face-to-face interaction are increased while the use of screen-based media and communication tools are eliminated. After five days of these conditions in an overnight nature camp, preteens' ability to recognize nonverbal emotion cues improved significantly more than the ability of the control group for both videotaped scenes and facial expressions.
41. Sherman LE, Michikyan, Greenfield PM: **The effects of text, audio, video, and in-person communication on bonding between friends**. *Cyberpsychology* 2013, **7** <http://dx.doi.org/10.5817/CP2013-2-3> (article 3).
- The authors compared feelings of emotional connectedness as they occurred in person and through digital communication among pairs of college friends. Twenty-nine pairs of close friends engaged in four conversations each: in-person, video chat, audio chat, and instant messaging (IM). Bonding, as measured by both self-report and affiliation cues, differed significantly across conditions, with the greatest bonding during in-person interaction, followed by video chat, audio chat, and IM in that order.
42. Gentile B, Twenge JM, Campbell: **Birth cohort differences in self-esteem, 1988–2008: a cross-temporal meta-analysis**. *Rev Gen Psychol* 2010, **14**:261-268.
43. Twenge JM, Campbell WK: **Age and birth-cohort differences in self-esteem: a cross-temporal meta-analysis**. *Pers Soc Psychol Rev* 2001, **5**:321-344.
44. Twenge JM, Campbell WK: **Increases in positive self-views among high school students: birth cohort changes in anticipated performance, self-satisfaction, self-liking, and self-confidence**. *Psychol Sci* 2008, **19**:1082-1086.
45. Twenge JM, Campbell WK, Gentile B: **Generational increases in agentic self-evaluations among American college students, 1966–2009**. *Self Identity* 2012, **11**:409-427.
46. Twenge JM, Campbell WK, Freeman EC: **Generational differences in young adults life goals, concern for others, and civic orientation, 1966–2009**. *J Pers Soc Psychol* 2012, **102**:1045-1062.
47. Konrath T, O'Brien EH, Hsing C: **Changes in dispositional empathy in American college students over time: a meta-analysis**. *Pers Soc Psychol Rev* 2011, **15**:180-198.
48. Oishi S, Graham J, Kesebir S, Galinha IC: **Concepts of happiness across time and cultures**. *Pers Soc Psychol Bull* 2013, **39**:559-577 <http://dx.doi.org/10.1177/0146167213480042>.
49. Manago AM, Greenfield PM, Kim J, Ward LM: **Changing cultural pathways through gender role and sexual development: a theoretical framework**. *Ethos* 2014, **42**:198-221 <http://dx.doi.org/10.1177/0956797613479387>.
- Utilizing anthropological, sociological, and psychological evidence, this article tests Greenfield's theory of social change and human development in the domain of gender roles and cross-sex relationships. As predicted by the theory, with movement in a community toward greater economic means, formal education, technological development, or urbanization, gender roles shift from a focus on family responsibility and formation to an emphasis on personal responsibility and pleasure.
50. Ortner SB: *New Jersey Dreaming: Capital, Culture, and the Class of '58*. Durham, NC: Duke University Press; 2003.



51. Twenge JM, Sherman RA, Wells BE: **Changes in American adults' sexual behavior and attitudes, 1972–2012.** *Arch Sex Behav* 2015 <http://dx.doi.org/10.1007/s10508-015-0540-2>.

52. Park H, Twenge JM, Greenfield PM: **The great recession: implications for adolescent values and behavior.** *Soc Psychol Pers Sci* 2014, **5**:310-318 <http://dx.doi.org/10.1177/1948550613495419>.

On the basis of Greenfield's (2009) theory of social change and human development, the authors predicted and found that adolescents' values, behaviors, and self-assessments became more collectivistic and less individualistic during the Great Recession (2008–2010) compared to the prerecession period (2004–2006), thereby reversing long-term trends from the 1970s. Correlations with economic indicators (median income, employment rate) over the entire time period (1976–2010) showed that collectivism was high, individualism low during times of economic deprivation, consistent with Greenfield's theory.

53. Zeng R, Greenfield PM: **Cultural evolution over the last 40 years in China: using the Google Ngram Viewer to study implications of social and political change for cultural values.** *Int J Psychol* 2015.

A study utilizes Google Ngram Viewer to observe the frequencies of words that indicate cultural values from 1970 to 2008 to see if Chinese society has shifted from its more collectivistic roots toward individualism in accordance to Greenfield's theory of social change and human development. Words that indicate adaptive individualistic values rose in their frequency while words that indicate collectivistic values either dropped in their frequency or increased more slowly than the words with individualistic values between 1970 and 2008.

54. Xu Y, Hamamura T: **Folk beliefs of cultural change in China.**

• *Front Psychol* 2014, **5**:1066 <http://dx.doi.org/10.3389/fpsyg.2014.01066>.

Using survey methodology and large-scale content analysis of books using the Google Ngram Viewer, researchers identified two Chinese folk beliefs concerning cultural change: 1. Belief that materialism and individualism had increased. 2. Belief that the importance of freedom, democracy and human rights had increased. In contrast, family relations, friendship, and patriotism were seen as having enduring importance; they were not seen to be a target of cultural change.

55. Hamamura T, Xu Y: **Changes in Chinese culture as examined through changes in personal pronoun usage.** *J Cross-Cult Psychol* 2015, **46**:930-941.

56. Chen X, Cen G, Li D, He Y: **Social functioning and adjustment in Chinese children: the imprint of historical time.** *Child Dev* 2005, **76**:182-195.

This important study demonstrates that, under conditions of rapid social change, child characteristics can change their meaning in an astonishingly short period of time. The characteristic of shyness was associated with social and academic achievement in a cohort of Chinese elementary school children assessed in 1990. By 2002, shyness, a quality less adapted to the environment of a market economy, was associated with peer rejection, school problems, and depression.

57. Manago AM: **Connecting societal change to value differences across generations: adolescents, mothers, and grandmothers in a Maya community in Southern Mexico.** *J Cross-Cult Psychol* 2014, **45**:868-887 <http://dx.doi.org/10.1177/0022022114527346>.

58. Manago AM: **Values for gender roles and relations among high school and non-high school adolescents in a Maya community**

**in Chiapas, Mexico.** *Int J Psychol* 2015, **50**:20-28 <http://dx.doi.org/10.1002/ijop.12126>.

The study depicts gender role and cross-sex relational values among adolescents in a southern Mexican Maya community, where, in 1999, high school was introduced. Responses to ethnographically based vignettes revealed that adolescents who had stopped their education after elementary school prioritized ascribed and complementary gender roles, as well as the importance of family mediation in cross-sex relations. In contrast, a matched group of high school students prioritized equivalent and chosen gender roles, as well as personal fulfillment and responsibility in cross-sex relations.

59. Garcia C, Rivera N, Greenfield PM: **The decline of cooperation, the rise of competition: developmental effects of long-term social change in Mexico.** *Int J Psychol* 2015, **50**:6-11 <http://dx.doi.org/10.1002/ijop.12120>.

Two experimental studies utilizing Greenfield's theory of sociocultural change and human development explored the impact of decades of globalized social change for children's development of cooperation and competition in Mexico. As predicted, the Marble Pull procedure showed a large drop over time in levels of cooperative behavior, with a corresponding rise in competitive behavior.

60. Park H, Joo J, Quiroz B, Greenfield PM: **Sociodemographic factors influence cultural values: comparing European American with Korean mothers and children in three settings — rural Korea, urban Korea, and Los Angeles.** *J Cross-Cult Psychol* 2015.

61. Greenfield PM, Quiroz B: **Context and culture in the socialization and development of personal achievement values: comparing Latino immigrant, families, European American families, and elementary school teachers.** *J Appl Dev Psychol* 2013, **34**:108-118.

The study documents cross-cultural similarities and differences in values surrounding personal achievement between Latino immigrant parents, multiethnic teachers, and European American parents. As predicted by Greenfield's (2009) theory of social change and human development, Latino immigrant parents, averaging a fifth-grade education, responded more familistically than the more highly educated multiethnic teachers or European American parents to scenarios about family life. In contrast, no group differences showed up in school-based situations that did not impact family values.

62. Vasquez-Salgado Y, Greenfield PM, Burgos-Cienfuegos R: **Exploring home-school value conflicts: implications for academic achievement and well-being among Latino first-generation college students.** *J Adolesc Res* 2014:1-35 <http://dx.doi.org/10.1177/0743558414561297>.

A qualitative study revealed that first-generation Latino college students from immigrant families experience conflict between family obligations and academic obligations, such as having to choose between doing academic work and attending family events, visiting parents, or family assistance. These conflicts were experienced as persisting over time and having a negative impact on academic achievement and well-being.

63. Burgos-Cienfuegos R, Vasquez-Salgado Y, Ruedas-Gracia N, Greenfield PM: **Disparate cultural values and modes of conflict resolution in peer relations: the experience of Latino first-generation college students.** *Hispanic J Behav Sci* 2015 <http://dx.doi.org/10.1177/0739986315591343>.