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Stigmatized Biologies: Examining the Cumulative Effects of Oral Health Disparities for Mexican American Farmworker Children

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Abstract

Severe early childhood caries (ECC) can leave lasting effects on children's physical development, including malformed oral arches and crooked permanent dentition. This article examines the way that ECC sets up Mexican American farm worker children in the United States for lasting dental problems and social stigma as young adults. We examine the role of dietary and environmental factors in contributing to what we call "stigmatized biologies," and that of market-based dental public health insurance systems in cementing their enduring effects. We adapt Margaret Lock's term, *local biology,* to illustrate the way that biology differs not only because of culture, diet, and environment but also because of disparities in insurance coverage. By showing the long-term effects of ECC and disparate dental treatment on farmworker adults, we show how the interaction of immigrant caregiving practices and underinsurance can have lasting social effects. An examination of the long-term effects of farm worker children's ECC illustrates the ways that market-based health care systems can create embodied differences that in turn reproduce a system of social inequality.

Keywords

oral health disparities; Latino health paradox; Medicaid; local biologies; immigrant health

Raquel's history of "bad teeth" began when she was barely two and a half. That was when her front teeth started to "crack," Raquel's mother, Margarita, remembers. "They were falling off in little pieces," Margarita says. Margarita had never seen a child's teeth rot; in her hometown in rural Michoacán, Mexico, tooth decay was rare even among adults. When she asked Raquel's doctor about her child's teeth, he told her she should no longer allow Raquel to bottle-feed at night. Margarita took away the child's bottle but even that did not stop the advancing decay.

When Raquel entered a Head Start preschool at three, she was required to have a dental screening. The program referred Raquel to one of the few dentists in the area who treated children with dental Medicaid; he screened 50 children each morning and brought the hard-luck cases back in the afternoon for fillings and crowns. Raquel's screening revealed that she needed urgent treatment. When Raquel emerged from her afternoon appointment, her mother remembers, her three upper front teeth were gone. "He pulled them; there was nothing left," Margarita says, still aghast. When Raquel entered school, she grew self-conscious about her toothless grin. She became a master of purse-lipped smiles; she learned to speak and laugh without revealing her gap.

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For years, Raquel had anticipated the arrival of her permanent teeth. She imagined them as white, straight, and perfect; they would fill the hole the dentist had left. Once they finally came in, she had thought, she would be able to grin without shame. Yet when Raquel entered middle school, these front teeth came in crooked. It seemed that Raquel's childhood decay and early extractions had permanently blighted her smile. She was no longer *molacha* (gap toothed), but she was still embarrassed to open her mouth at school. Where she had once had an empty gap, Raquel used to say, she was now cursed with something worse—*dientes torcidos* (crooked teeth).

This article explores the social, political, and biocultural contexts that shed light on Raquel's unfortunate oral health history. Placing Raquel's dental misfortune within the context of the biocultural transition her mother made in coming to the United States, we examine the factors behind the epidemic of Early Childhood Caries (ECC) among Latino farmworker children. How does the different environment immigrant caregivers face on arriving in the United States help explain Raquel's "cracked teeth"? What were the broader sociopolitical contexts that shaped Raquel's bottle-feeding? We argue that greater attention needs to be paid to placing our understanding of the health issues of immigrant children within a binational context, taking into account the dramatic transition immigrant parents make to life in the United States (see Horton and Barker n.d.).

Although the biocultural transition immigrant parents make in coming to the United States helps explain the high rate of ECC among their children, Raquel's dental misfortune cannot be attributed to caregiver practices alone. Instead, we show that California's dental Medicaid —or Denti-Cal—insurance policies exert an equally strong influence on the shape and health of Raquel's oral cavity. The underfunding of Denti-Cal reduces reimbursement rates for private dentists to a rate of 30 to 40 percent of what they receive from private insurances. This low reimbursement rate creates a two-tiered dental system; private dentists may extract, rather than restore, the teeth of children on Denti-Cal whom they deem difficult to treat (see Masterson et al n.d). Taking a critical medical anthropological approach, we argue that studies of embodiment must take into account the ways that socioeconomic circumstances and public policies—not just culture—are physically embodied. Examining the cumulative effects of these early inequalities, we show that immigrant caregiver practices interact with Denti-Cal policies over farmworker children's lifetimes to create their "stigmatized biologies." Although Raquel's diet and feeding practices helped set her up for decayed front teeth as a child, we show that Denti-Cal policies served to lock into place the long-term effects of this early misfortune.

Embodiment, Culture, and Class

A rich tradition in anthropological research examines how culture shapes both the experience and expression of bodily ailments (Csordas 1994; Good 1994; Kleinman 1982; Lock 1993). Perhaps one of the reasons that culture has assumed such salience in anthropological research on embodiment is the importance anthropologists assign to the subjective experience of illness. Anthropologists have powerfully critiqued the Cartesian assumptions of mind–body dualism that have relegated the subjective experience of illness to a lesser, immaterial role (Good 1994; Scheper-Hughes and Lock 1987). Instead, these scholars have shown the way that subjective experience resists partitioning into discrete categories of the material and immaterial. Studies of cultural idioms of distress have shown that illness is refracted through the prism of culture, and expressions of illness take different physical form across different groups (Low 1994; Nichter 1981).

Although anthropologists have used such cultural variation to critique the notion of the body as an invariant biological universal, their overemphasis on culture has obscured the salience

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of class and race. The disadvantage produced by social stratification leaves its imprint on our physiologies and physiognomies in innumerable ways. It is incumbent on critical medical anthropologists to contribute to the growing literature on health disparities and highlight these invisible pathways.

Public health scholars have recently put their own spin on the paradigm of "embodiment," urging a consideration of the material and social factors anthropologists have long neglected. Nancy Krieger, for example, uses the concept of "embodiment" to examine how individuals "literally incorporate, biologically, the social and material world in which we live" (2001:672). For Krieger, the concept of "embodiment" levels the perceived antinomy between the "social" and the "biological." Her model critiques biomedical and psychosocial approaches focused exclusively on endogenous biological responses for ignoring the social determinants of health. Meanwhile, she simultaneously faults political economic approaches to health for ignoring the biological. Boldly fingering economic and political institutions as the root causes of health disparities, she argues, scholars of the political economy of health must devote more fine-grained attention to the physiological channels through which illness is produced. Krieger's concept of "embodiment" thus provides a powerful yet finely tuned conceptual tool to examine the conjoint biological and social determinants of health.

Proposing a "multilevel" framework, Krieger urges attention to the interplay between the biological and the sociopolitical at multiple levels. She proposes that scholars analyze the specific pathways through which social disadvantage materializes as illness and disability. This concept of embodiment reveals racial disparities in health as not genetically determined but, rather, as the mutable and embodied expression of discrimination itself (Krieger 2001:673). She shows, for example, how the excess risk of hypertension among African Americans is the physical embodiment of myriad social and material factors—including residential and occupational segregation, exposure to toxic substances, interpersonal discrimination, the targeted marketing of commodities, and inadequate health care (Krieger 2001). Her model unmasks population patterns of health and disease as "biological expressions of social relations" (Krieger 2001:672). Yet even more provocatively, her approach allows for the cumulative interplay between biological development and social structure, taking into account the long-term health effects of inequalities embodied early in life (Krieger 2001:673).

Krieger's model is suggestive for an anthropological approach to how social, cultural, and political factors mediate oral health disparities for Latino farmworker children. Oral disease provides a ripe opportunity to examine the long-term interaction between biology and social structure. Krieger's model suggests that children's oral health disparities early in life will have long-term effects as they interact with the social circumstances children face later in life. Indeed, oral disease has important lasting effects on both systemic health and on children's long-term physical development. Periodontal disease alone has been linked to heart disease, stroke (Beck et al. 1996), and most recently to pancreatic cancer (Michaud et al. 2007). Severe ECC may adversely affect a child's self-esteem, speech development, and ability to eat (U.S. Department of Health and Human Services [USDHHS] 2000). Moreover, research in dentistry and physical anthropology suggests the long-term developmental effects of severe ECC, as the premature loss of primary teeth may also affect the permanent shape of the oral cavity itself (Corruccini 1984; Miyamoto 1976; Oppenheim 1964).

Yet oral disease adds an additional layer of complexity to Krieger's model of embodiment. Unlike other common chronic illnesses such as cardiovascular disease, asthma, or diabetes, severe ECC shapes not only children's physiology but also their physiognomy. The effects of severe oral disease are visible to the naked eye; they mark bodies with their second-class citizenship. Not only can the study of oral disease illuminate the pathways through which

social inequalities are intimately embodied but it also provides insight into the social implications of these visible markers of disadvantage. With their focus on the social significance of bodily markings—whether voluntary or involuntary—anthropologists have much to contribute to this arena of study. This article examines not only the material factors that mediate immigrant children's disproportionate rates of ECC but also their long-term effects on children's physical development and social prospects.

Placing Immigrant Children's Health Disparities in Context

There is a dearth of medical anthropological literature on oral health. Although epidemiological studies have long shown that Latino children suffer disproportionately from ECC, very little research places these statistics in a broader context. Latino children have poorer oral health than children from all other racial and ethnic groups in the United States; among all Latino subgroups, Mexican American children have the highest rates of oral disease (USDHHS 2000). Among Mexican Americans, children of farmworkers are particularly at risk. One study of such children in Yakima Valley, Washington, found that they suffered Baby Bottle Tooth Decay at five times the rate of the general population (Weinstein et al. 1992). A study based in Alabama showed that farmworker children aged two to nine had a dental caries rate five times higher than that reported for Mexican American children in the Hispanic Health and Nutrition Survey (Nurko et al. 1998). This study also found that U.S.-born children had a higher average of decayed and filled teeth than Mexican-born children, suggesting the possible role of factors intrinsic to life in the United States (see Horton and Barker n.d.).

There is a great deal of analysis in the dental public health literature about the behaviors that may lead to this high prevalence of oral disease among Latinos. Most of this research zeroes in on individual caregiver behaviors as the culprit, suggesting that Latino parents may be more likely to give children bottles or sweetened beverages at bedtime (Huntington et al. 2002; Shiboski et al. 2003; Weinstein 1992). Yet very little research systematically explores the sociopolitical contexts that mediate immigrant caregiver practices, nor their own conceptual frameworks for understanding the oral health consequences of their dietary and feeding practices (for an exception, see Horton & Barker 2008). No research places immigrant parents' feeding practices and understandings of children's oral disease in the context of the adjustment such parents make to the new biocultural environment they find in the United States To redress these gaps, our research asked the following questions: First, what are immigrant parents' feeding practices, and how are they shaped by the different biocultural environment within which they were raised? Second, how do state dental insurance policies ameliorate or exacerbate the incidence of oral disease for farmworker children? And, finally what might be the long-term effects of such pronounced ECC for farmworker children?

Methods and Fieldwork

This article is the result of two related studies on the causes of oral health disparities for Latino farmworker children in Mendota, a rural farmworking community in California's Central Valley. Dubbed the "Cantaloupe Capital of the World," Mendota has a large Latino immigrant population. The town's population is about 9,000 people, although this number swells to three times that amount during the summer harvest season. According to the 2000 Census, the population is 95 percent Hispanic, and 50 percent are "foreign born." The town was the fifth poorest in the state of California in 2000; the average annual family income is $17,000. Because of its poverty and high immigrant population, some social service providers pejoratively refer to the town a "port of entry" for Mexican immigrants; others call it a "migrant labor camp."

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For the first study (detailed in Barker and Horton 2008), Horton conducted nine months of intensive fieldwork on the familial and social contexts that contribute to Mexican American children's high rates of ECC. To understand caregivers' beliefs and behaviors regarding oral disease, she conducted interviews with 26 Mexican immigrant parents. Criteria for participation included being a Mexican immigrant and a primary caregiver for a focal child under the age of six. Caregivers were recruited through two methods: two-thirds through a randomized list of household addresses generated by a partner study on farmworker occupational health, and one third through two local Head Start preschools. Caregivers had been in the United States a mean of nine years and were predominantly from rural Mexico.[1] Their median family income was $17,150 and they averaged 2.7 children per family.

This first study revealed the importance of both the biocultural transition immigrant parents made in coming to the United States and the dental health care system in shaping low-income Latino children's oral health. Interview questions included caregivers' understandings of the causes of oral disease, their oral hygiene and infant-feeding practices, and their children's dental experiences.[2] Midway through her first round of interviews, Horton discovered that immigrant caregivers reported having had very different oral health profiles as children than their own offspring. Because these early formative experiences shaped their oral hygiene behaviors toward their children, she returned to interview all caregivers about their own oral disease experiences and dietary practices in their countries of origin. This study revealed the pronounced biocultural transition immigrant caregivers navigated in coming to the United States as they adopted a dramatically different diet and infant feeding practices.

Yet caregiver behaviors did not singlehandedly create Latino oral heath disparities; tracking the effects of social and policy contexts required analysis at multiple levels. The first study included interviews with 12 dentists in the large rural region surrounding Mendota, all of whom accepted California's dental Medicaid insurance program, or Denti-Cal. These interviews revealed the way that Denti-Cal reimbursement policies exerted a profound influence on clinical practice and the kind of treatments low-income children received. Focusing on the way that Denti-Cal policies created disparate patterns of dental treatment for low-income children in public and private dental clinics,[3] our second study explored this issue in greater depth. Our research team conducted interviews with ten additional dentists, 12 office managers and billing clerks, and two clinic directors within the county.[4] We examined how Denti-Cal policies affected clinic finances, and what treatment strategies dentists devised to remain financially viable. We asked clinic directors and office managers how Denti-Cal reimburses their clinics, and dentists how this reimbursement structure affected their practice. To better understand the policy context behind Denti-Cal

[1]For the purpose of analysis, we defined caregivers as having rural origins if they came from a town of 15,000 people or less. Only four caregivers came from towns of more than 15,000 people.

[2]Interested participants were screened for eligibility and recruited into the study by interview staff, who obtained informed consent. All interviews relied on an open-ended interview guide approved by the institutional review board of the University of California, San Francisco. Interviews, lasting from one to two hours, were conducted by two bilingual interviewers. Each participant was interviewed at least once; several were interviewed up to three times. Participants received a $20 gift certificate to a local grocery store for a first interview, and a $10 certificate for subsequent interviews.

[3]This article focuses specifically on the data from the interviews with private dentists within Fresno County, as 98 percent of Denti-Cal recipients see private dentists. The broader study examined differences in strategies among public and private dentists who treat low-income Latino children on Denti-Cal in one rural and one urban county. In total, we interviewed 24 dentists (15 private and 16 public), 20 office managers and billing clerks (11 private and nine public), and eight clinic directors (five private and three public). Within the rural county alone, we interviewed ten dentists (six private and four public), 12 office managers and billing clerks (five private and seven public), and two clinic directors (all private). This study, "California's Public Dental Health Insurance Program: Creating Disparities in Oral Health Care for Disadvantaged Latino Children" (Judith C. Barker, PI, and Sarah B Horton, Co-PI), was funded through a research grant in 2006 from the University of California Institute for Mexico and the United States (known as UC MEXUS).

[4]Three of the dentists in our rural sample practiced simultaneously in private and public clinics; they spent several days a week in private practice and the remaining days in public practice. For the purposes of this article, they are counted as "private dentists."

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reimbursements, we conducted seven interviews with officials within the California State Office of Oral Health.

Finally, to gain insight into the long-term effects of farmworker's children's high rates of ECC, the first author conducted interviews with four farmworker young adults. These interviewees were chosen randomly from households in the same enumeration list with the goal of finding youths with backgrounds comparable to those of the children of immigrant caregivers. In short, we attempted to select farmworker young adults who might represent the focal children's future selves. Criteria included being 18 and over and born to Mexican immigrant farmworking parents.[5]

Using an iterative analysis, the authors analyzed the data from each study for patterns and themes, which were then linked to existing theory. The approach we used is inductive and "grounded in the data" as opposed to deductive—or assessing the data using a priori hypotheses and theoretical constructs.. We read through each body of data and isolated a series of relevant themes, some of which also recurred in the literature. We coded each interview. When data analysis had been performed for each study, we then compared our findings regarding patterns of dental treatment for Latino farmworking children to discern areas of overlap or contrast. We found that the information we gained from our interviews with dentists who accept Denti-Cal helped illuminate a theme that recurred in several interviews with Latino caregivers—the extraction, rather than restoration, of their children's decayed front teeth.

The Biocultural Transition: Immigrant Caregivers' Diet and Infant Feeding Practices

An understanding of immigrant parents' backgrounds helped reveal the distinct biocultural context in Mexico that shaped their feeding practices and their conceptions of oral disease and its causes. The majority of caregivers came from the classic sending states in western and central Mexico—Michoacán, Jalisco, Zacatecas, and Guanajuato. Rural communities in central and western Mexico have long been linked to the Central Valley through migration networks, yet such routes were institutionalized during the Bracero Program of 1942–64. During this period the United States imported 4.6 million Mexican laborers—many of them small landholders and peasants—to work as temporary "guestworkers" in agriculture and the railroads (Ngai 2004). In short, migration networks from rural parts of western and central Mexico generally provide the supply of farm laborers to feed the demands of California agribusiness. Thus, all but four of the Mexican caregivers the first author interviewed were from small rural towns they termed *ranchos* or *ranchitos*—towns of 15,000 people or less. Because of their rural origins and recent arrival, they were less familiar with U.S. biomedical understandings of the causes of oral disease and its proper treatment.[6]

Caregivers' oral health experiences were shaped by the environments in which they were raised in Mexico—environments that contrasted sharply with those their children faced in the United States. An examination of the diets and infant feeding practices caregivers described as being common to rural Mexico illustrates the biocultural transition they underwent on arriving in the United States. All but two of 26 caregivers had grown up on

[5]Although our aim in interviewing adult children of farmworkers was to gain an understanding of the long-term social effects of oral health disparities for farmworker children, we cannot assume that such adults precisely represent the adult selves of the focal children in our first study. A full understanding of the long-term consequences of oral health disparities for farmworker children would require a longitudinal study, which we were unable to do. However, given these limitations, we do feel it is reasonable to infer that the focal children in our first study might face similar social consequences of their pronounced oral decay once they reached young adulthood.

[6]Immigrant parents' predominantly rural origins' make their transition to life in the United States more acute. For more information on the contrasts among diets, infant feeding, and oral hygiene practices in rural and urban Mexico, see Horton and Barker n.d.

family farms in which their diets depended on subsistence agriculture. Only one caregiver—whose family was wealthier than the others—described her diet as having been high in processed and refined foods because her family owned a small store. Yet the relatively uncariogenic diet of rural Mexico strongly contrasted with the diet they encountered on arrival in the United States—one in which sodas, candies, and processed and refined foods were the norm.

On arrival in the United States, immigrant caregivers' socioeconomic circumstances as well as federal policy shaped a dramatic change in infant feeding practices. The structure of farmwork, combined with federal policies that make infant formula affordable, encouraged a shift from breast-feeding to bottle-feeding. Because it is low-paid work, few farmworking families can survive without mothers themselves entering the workforce. Immigrant mothers found themselves newly navigating a contradiction between the task of farmwork and that of mothering (see de la Torre 1993). Although their own mothers had helped out at family farms in rural Mexico, the rhythms of industrial farmwork in the United States do not accommodate childcare. None of the women we interviewed simultaneously worked in the field and breast-fed their children. In fact, women reported that the amount of time they breast-fed their children was directly shaped by the seasonal schedule of farmwork. Most women worked during the lucrative summer harvest season and rested during the winter. Thus, a child born directly after the harvest season might be breast-fed for six months, whereas one born in the late spring or summer might not be breast-fed at all. In short, the structure of farmwork demanded that working mothers bottle-feed their children; breast-feeding was a luxury few farmworking mothers could afford.

If farmwork itself makes bottle-feeding incumbent, federal policies through WIC abet this transition from breast-feeding to bottle-feeding. The cost of infant formula in Mexico had made it a luxury few peasant families could afford, yet WIC coupons make infant formula affordable. Farmworking mothers often described WIC coupons for infant formula as *una gran ayuda* (a great help). Indeed, one mother from urban Colima had explained that she was forced to bottle-feed her two eldest children in Mexico with infant formula when her "milk dried up." This was a great hardship for her family; she paid $18 each week—nearly half her husband's weekly income—on infant formula for her two children. Her own mother had tried "everything she could" to encourage this woman's milk to flow—including *remedios caseros* (home remedies) such as rubbing her back with hot oils—"but nothing worked," she said. In the United States, in contrast, WIC coupons made infant formula readily accessible at low cost. Given the need for women to work, and the cheap cost of formula, the economic calculus of infant feeding had flipped on its head—in the United States, breast-feeding, rather than bottle-feeding, became more costly.

A quick glance at the numbers helps illustrate how pronounced this transition was for immigrant caregivers. Fourteen of the 26 caregivers we interviewed reported that they had bottle-fed their U.S.-born children alone; an additional nine had combined breast-feeding with bottle-feeding. Those caregivers who did combine breast-feeding with bottle-feeding did so for only a brief period of time—the average time a child was breast-fed was seven months. Only four of the 55 U.S.-born children in our sample were breast-fed alone. Yet immigrant women themselves had predominantly been breast-fed when they were children—partly because of custom and partly because of the high expense of formula. Only two of our 26 immigrant caregivers reported having been predominantly bottle-fed because of exceptional circumstances—because their mothers "could not breast-feed."

Moreover, the majority of the caregivers in our sample had bottle-fed their children until late—until two or three years of age. A mix of structural and cultural circumstances help explain this practice. As immigrant caregivers understood it, the bottle—a substitute for

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their breast—had come to stand in for mothering. Once children had grown accustomed to bottle-feeding, immigrant mothers found it difficult to prize the bottle from their hands. Although WIC urged mothers to wean their children by the age of one, mothers said they often grew tired of *luchando* (struggling) with their children. Many immigrant mothers gave the bottle to their children as a comfort during daycare or when they put them to sleep at night.

Because immigrant mothers were first-generation bottle-feeders, they were unprepared for the oral health consequences of prolonged bottle-feeding. Studies have linked the consumption of sugary liquids in bottles for prolonged periods of time to “Baby Bottle Tooth Decay”—or the decay of the front upper teeth (Shiboski et al. 2003). Unaware of such consequences, some immigrant caregivers placed juice or Nesquik®-flavored milk in bottles and allowed their children to feed at night. The structure of farmwork and the availability of infant formula had encouraged immigrant caregivers to abandon breast-feeding in favor of bottle-feeding. Yet because they were unaccustomed to the oral hygiene requirements of the new cariogenic environment they found in the United States, their adoption of appropriate health behaviors lagged behind their adoption of new infant feeding practices.

The experiences of Lupita, a mother from La Cañada, Michoacán, serve to illustrate this biocultural transition. Lupita grew up on a family farm where her family regularly consumed the corn, garbanzos, wheat, and lentils they themselves grew. Because of her family’s poor peasant origins, sweets and sodas were a luxury. She remembers that her younger brother was breast-fed until age three; she assumes she was as well. “Because what other way could it be?” she asks. Formula, she says, was too expensive. Yet on migrating to the United States, her entry into farm work made breast-feeding more difficult. When she had her first child in March, she switched him to infant formula after two months so she could work during the lucrative harvest season. “We have to leave at four in the morning, and get home at four in the afternoon. For that reason there’s the problem that here kids drink more bottle than mother’s milk,” she says. Her son drank from the bottle until he was three. Unaware of its detrimental impact on teeth, she sometimes put him to bed with Nesquik®-sweetened milk.

Lupita’s experiences illustrate the pronounced biocultural transition parents from rural Mexico experience as they arrive in a markedly different environment in the United States. Although families’ socioeconomic needs required that women abandon breast-feeding in favor of bottle-feeding, immigrant mothers were unfamiliar with the oral hygiene requirements of this new infant feeding practice. They had adopted bottle-feeding in a markedly new environment—one of plentiful access to formula and low-cost sugary drinks. If we return to the opening story of Raquel’s successive dental misfortunes, we can understand how Margarita’s adjustment to her new life in the United States helped mediate her daughter’s early childhood caries. Accustomed to the relatively less cariogenic diet and infant feeding practices of rural Mexico, immigrant caregivers’ oral hygiene practices had not adapted as quickly to their new circumstances.

The Policy Context: Creating Embodied Inequalitie

Although caregiver dietary and feeding practices helped create a high incidence of decay among children of farmworkers, they are not the only factors that contribute to such embodied inequalities. Denti-Cal policies constrain the kinds of treatment available to children, and play just as large a role in shaping their physical development. Low Denti-Cal reimbursement rates led to disparate treatment patterns for rural low-income children, particularly for those whose severe ECC made them difficult to treat. Thus, we show that the biocultural transition of immigrant caregivers interacts with underinsurance to create a

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specific form of embodied inequality. Although caregivers' infant feeding practices contribute to farmworker children's "stigmatized biologies," poorly funded dental public health insurance systems cement their enduring effects. This interaction creates long-lasting bodily differences that affect not only farmworkers' children's health but also their prospects for the future.

Health insurance in the United States has historically been contingent on permanent, full-time employment (Sered and Fernandopulle 2005). There are few industries in low-income communities like the Central Valley that offer such employment; farm work is temporary and seasonal work and does not carry such benefits. Instead, farmworking families are dependent on government health insurance programs for the low income such as Medi-Cal and Denti-Cal. Although farmworker children with legal status may qualify for Medi-Cal or Denti-Cal, undocumented residents must resort to a county health insurance program or to emergency Medicaid, a federal program open to the undocumented family members of citizens. These programs pay only for emergency dental treatment such as extractions. Because their parents were uninsured farmworkers, the children in our sample were forced to rely on Denti-Cal or on limited emergency services. Thus, Mendota served as a kind of perverse "natural laboratory" in which to view the effects of underinsurance on children's health.

Let us first explain why a market-based dental insurance system may leave a particularly lasting imprint on a child's oral health. Oral health is a sensitive measure of the state of the health care safety net because oral health is often less of a public priority than general physical health. Oral disease is the most common chronic childhood illness; dental care accounts for roughly 25 percent of total health care spending for children in the United States. Yet it comprises only 2.3 percent of Medicaid funding nationwide (Millbank Memorial Fund 1999), and only 2 percent of California's Medicaid budget. Because of their limited funding, public dental health insurance programs are underfunded and understaffed. Given children's greater need for dental care than adults, a Medicaid system that underfunds dental treatment disproportionately affects low-income children.

Ninety eight percent of patients with Denti-Cal receive treatment in private practice (California HealthCare Foundation 2007:19). Yet barriers to access and obstacles to quality treatment for Denti-Cal patients are particularly pronounced in private clinics. Denti-Cal rates have remained stagnant since 1995, when a California court ordered a 60 percent rate hike because the low number of dentists who accepted Denti-Cal compromised beneficiaries' access. Denti-Cal currently reimburses private dentists at 30 to 40 percent the rate they receive from private insurances. Low reimbursement rates compound preexisting barriers to access for young children, whose behavioral issues make dentists consider them to be especially difficult to treat. This narrows the field of available dentists. Within a 50-mile radius of Mendota—a catchment area serving a population of roughly 800,000—only five dentists accepted children under five insured by Denti-Cal. The underfunding of California's Denti-Cal system in turn translates into reduced reimbursement rates for participating dentists, and obstacles to access for its beneficiaries.

Those private dentists who did accept young children on Denti-Cal viewed themselves as having a "mission" to help the underserved. As one such dentist explained: "I made a decision with the Lord a long time ago that I'd always treat Medi-Cal children three and under. There are so many dentists that'll treat the other ones but nobody in town will treat the younger ones." Despite dentists' ethic of care, low Denti-Cal reimbursement rates translated into strict limitations on the treatment for such patients. Private clinics were governed by two different salary structures. In one, dentists had a set "per diem"—a target amount of money they had to bill each day—and pocketed a percentage of the money earned

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beyond that as an incentive. In the second, dentists worked “on commission,” receiving a set percentage of their earnings. In either scenario, Denti-Cal patients pose a liability. Because each Denti-Cal patient represented a 70 percent reduction in reimbursement as compared to a privately insured patient, private dentists who accept patients with Denti-Cal had to adopt specific strategies of treatment to remain financially viable.

Private dentists reported two distinct treatment strategies they employed to “stay afloat” while continuing to see patients with Denti-Cal. One was to hold constant the percentage of their patients on public insurance, limiting it to a set percentage of their overall patient base. They only scheduled appointments with Denti-Cal patients on certain days of the week; they refused to accept new such patients when they had exceeded their limit. These strategies resulted in restricted access to care for Denti-Cal patients, and longer wait times for a first appointment. In one private pediatric clinic, for example, the wait was four to five months for a new patient with Denti-Cal and only four weeks for a new patient with private insurance.

A second strategy was to economize on the time spent on Denti-Cal patients. Under this approach, dentists attempted to perform as many services as possible within a single visit to maximize reimbursements. This led to a “Medicaid mill” approach in which dentists screened and treated Denti-Cal patients en masse. For example, one dentist saw 50 children on Denti-Cal on Monday mornings and then performed treatment on those who needed it during the afternoon. Another, who offered general anesthesia—a service much in demand—reported screening 152 patients in one morning. As one such dentist explained: “Once I get in there [into the patient’s mouth], I just try to do as much as possible—I’ll fix a whole mouth in one sitting.” Because such dentists specialized in an unprofitable niche market—one with greater demand than availability—they treated young children with Denti-Cal in an assembly-line manner.

Because private dentists felt they were “racing against the clock—as one put it—many avoided performing time-extensive procedures that were covered by Denti-Cal but reimbursed poorly. One dentist who performed root canals, for example, complained that his office was constantly swamped with requests because so few other dentists would do them. Other private dentists would not make dentures or bridges for Denti-Cal patients. In the case of children’s dentistry, two of ten private dentists we interviewed in the county did not perform pulpotomies, or a children’s version of a root canal. Although dental school guidelines recommend that all precautions be taken to save children’s teeth to ensure the health of their permanent teeth, low Denti-Cal reimbursements make restorations prohibitive. One such dentist referred children who needed pulpotomies to other dentists, and the other said he had seen very few cases in which a pulpotomy, rather than an extraction, was warranted. Restorations require the effective management of children’s discomfort for a more prolonged period of time, and Denti-Cal does not reimburse them at significantly higher rates than extractions. As a dentist who left private practice to work for the county summed it up: “Denti-Cal actually encourages the extraction rather than restoration of children’s teeth.”

Denti-Cal’s low reimbursement rates contribute to a two-tiered dental health care system. Private dentists treating Denti-Cal patients must economize on the time and resources they devote to them, creating distinct treatment patterns for patients with Denti-Cal and those with private insurance. Pressures of time and money may lead even the best-intentioned providers to deliver disparate care, and to unintentionally short change patients deemed difficult to serve (Good et al. 2003). Such disparate treatment may be particularly accentuated in the case of children with severe oral disease, whose pain makes them difficult to manage. Simply put, low reimbursement rates and heavy caseloads—the very

circumstances faced by private dentists participating in Denti-Cal—may encourage them to extract, rather than restore, low-income Latino children's teeth.

Disparate Dental Treatment for Farmworker Children

Denti-Cal's low reimbursement rates leave a lasting physical imprint on farmworker children's bodies; this structural disadvantage is incorporated into children's physical development in enduring ways. Research in physical anthropology suggests that dental crowding—or "crooked teeth"—is specific to populations in industrialized societies because of the effect of environmental factors on the development of the jaw. The premature loss of a child's front teeth and the consumption of soft, processed foods may understimulate the jaw in particular places, leading to its uneven development (Corruccini 1984; Lombardi 1982). Crooked teeth derive from insufficient jaw space to accommodate tooth size, as normal-sized teeth emerge within an insufficiently developed jaw (Begg 1954). In short, the premature extraction of children's front teeth—the very teeth often affected by "Baby Bottle Tooth Decay"—may lead to underbites, overbites, and "crooked teeth" (Oppenheim 1964).

Raquel was correct in intuiting the source of her "curse"; her crooked smile can indeed be chalked up to her early extractions. Although her early childhood caries set her up for the potential for lasting oral disease, the premature extraction of her front teeth encouraged her permanent teeth to come in crooked. Denti-Cal's encouragement of extractions, rather than restorations, locks children's early oral health disparities in place, helping create farmworker children's stigmatized biologies.

The underfunding of Denti-Cal thus creates disparities in care for children—and "difficult to treat" Latino children especially—disparities that in turn have long-lasting effects. To illustrate how Denti-Cal policies help create such stigmatized biologies, we examine oral health over the lifespan of farmworker children. Drawing on the interviews with caregivers from our first study, we begin with the dental treatment of children under six.[7]

The experiences of several other caregivers with young children corroborate Raquel's experience, illustrating the bodily effects of low Denti-Cal reimbursements. Four of our interviewees had brought their small children to a single private dentist in town only to hear that several of the child's front teeth had to be extracted. As undocumented and uninsured immigrants, these parents were often accustomed to extractions as the only solution to their own tooth pain. Yet they were horrified at the prospect of their children remaining *molacho* (gap toothed) throughout their childhood. In two cases, parents took their children to a different dentist for a second opinion and their children received pulpotomies to save the structure of their teeth.

The experiences of Hector Carrillo, a child now five, are illustrative. When Hector was one and a half, his mother noticed that his upper front teeth were becoming "stained"; she described them as "coffee colored." Because Hector had been sleeping with his bottle full of juice, they bore the telltale signs of Baby Bottle Tooth Decay. She stopped giving Hector a bottle, but by the time he was two, his teeth had decayed so badly that they had rotted to his gumline. He couldn't chew with his front teeth anymore because they were too short. She had to cut up chicken and meat for him and the child ate using the sides of his mouth.

When she took Hector to a private dentist in town, he filled two of Hector's back molars but told his mother that there was no solution for his four upper front teeth but to pull them.

[7]The interviews we draw on in this section are from the intensive interviews with caregivers of children under six conducted during the first study, "Hispanic Oral Health: A Rural and Urban Ethnography."

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Hector's mom didn't want him to remain *molacho* at such a young an age, so she stalled. She took him to the same dentist twice a year. Each time, the dentist did cleanings but told her there was no hope for his front teeth. Finally, when Hector was four, Hector's mom talked to her family doctor and he told her about a pedodontist an hour's drive away who treated children with the aid of general anesthesia. She made an appointment. After an hour and a half, Hector woke up with three new silver crowns; the pedodontist had been able to save three of the four teeth the local dentist had earlier pronounced "no good."

Hector's mom's extra effort and determination helped ensure that Hector did not remain *molacho*. Yet other parents are not so savvy. Another parent noticed that her daughter's teeth were going "brown" when she was three. At her doctor's suggestion, she took Sindy to the local dentist and was shocked when he said he'd have to extract her front upper two teeth. For four full years, Sindy had a toothless smile. When Sindy's permanent teeth emerged at the age of seven, they came in buck toothed. The early extractions of Sindy's front teeth may be to blame for the crookedness of her permanent teeth, as they may have led to the uneven development of her jaw.

Conscious of her crooked front teeth, Sindy tries to avoid smiling or laughing. The other children at school tease Sindy because of her crooked teeth; she often plays by herself. When she won an essay contest in fourth grade, she refused to smile for the photographer. Thus, Sindy's perceived disfigurement is stigmatizing, has led her to become what Goffman (1963) calls "discreditable." As Goffman would argue, Sindy attempts to contain this damage to her identity, her sense of self through the avoidance of situations in which her disfigurement is made visible. The experiences of Hector and Sindy illustrate the way that Denti-Cal policies help shape the stigmatized biologies of farmworker children, creating bodily differences that in turn affect their sense of self.

What are the long-term consequences of the interplay between biocultural contexts and insurance policies; how might they affect farmworker children over their lifespan? Horton's oral health histories with farmworker young adults who attempted to leave Mendota provides a glimpse of an underfunded health care system's lasting effects. We describe below the oral health histories of two such young adults—one who had the relative advantage of Denti-Cal as a child and one who did not. Each narrative shows how immigrant caregiver practices interact with state insurance policies to create stigmatized biologies. As we show, this in turn reproduces a system of social inequality through visible bodily markers.

Stigmatized Biologies

In their oral health histories, a number of young adults in Mendota spoke of the time and money they invested in dentistry. It was not uncommon for such farmworker children to reach adolescence and become more concerned about the appearance of their teeth. Concerns about their appearance became most acute in the cases of the young men and women we interviewed who had left this poor farmworking community to seek professional jobs elsewhere (see Horton and Barker 2009a for more examples). One such young adult, for example, said his oral health was a significant and continuous personal expense; he spoke of "constantly sinking money into [his] mouth." Another took advantage of a trip to visit family in Tijuana, Mexico, to attempt to restore and straighten her teeth, amassing a bill of nearly $3,000. To explore this phenomenon, we begin with the story of Estevan. An aspiring politician, Estevan found that his teeth served as a formidable barrier to his upward social mobility. Estevan's story illustrates not only the lasting imprint left by Denti-Cal policies on young farmworking children's bodies but also their long-term social effects.

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Estevan: "Sinking Money into my Mouth"

Estevan was born outside Mendota in 1977 to a family of seven raised by a single farmworking mother. His family was not particularly concerned about oral health when he was a child; his mother did not regularly brush his teeth. From the bottle-feeding practices of his younger brothers, he imagines that she gave him juice in his bottle as well. By the time he was two, his five front teeth had become brown and cracked. Because of his pain, Estevan refused to open his mouth during his dental visits. Estevan badly needed dental treatment, but he was deemed "uncooperative." He had to be referred to a private dentist, an hour's drive away. It's unclear whether these five teeth could have been saved with pulpotomies, but the dentist extracted them all.

Estevan's negative dental experiences as a child set him up for a lifetime of dental fear and poor oral hygiene. By middle school, his permanent teeth had come in crooked—likely because of his premature extractions. Ironically, although Denti-Cal's low reimbursement rates may encourage some dentists to perform extractions, rather than restorations, the program does not pay for the orthodontics that would fix the long-term problems such extractions create. Denti-Cal only covers braces in cases of "medical necessity"—if children's crooked teeth hinder their bite or prevent their eating. Thus, although Estevan's early dental experiences had led to a lack of preventive care, his extractions may have set him up for visibly crooked teeth as an adult.

Although Estevan was embarrassed about his crooked front teeth during high school, it wasn't until he left Mendota and went to college that he became acutely self-conscious. "It wasn't that big a deal in high school as a lot of people had bad teeth," he explained. Yet Estevan had started college far from home at California State University, Sacramento; he was doing well in classes and was considering a career in politics. He was overseeing a welfare-to-work program at the time and was concerned he might be mistaken for a participant. So he went to an orthodontist to get fitted for braces and was told that he would first have to attend to the issues he had neglected as a child. Estevan first had four root canals and five fillings, for which he paid a total of $5,000 out of pocket. The braces cost him an additional $4,000.

Thus, for Estevan, good teeth are clearly linked with social mobility. His teeth have become a means through which to signal his distance from his farmworking roots. Indeed, Estevan has since become one of Mendota's more successful sons, interning for a Sacramento-based Congressman in Washington DC and now serving as a member of the local City Council. Yet although Estevan has a gleaming smile, he says he wants still more dental work. He wants to have his four front teeth shaved down and restored with new caps, and to have his 12 amalgam fillings replaced with porcelain ones. For Estevan, his teeth were the most visible signal of his humble farmworking roots, and dental care his ticket into a new class bracket. In short, self-funded dental treatment is the price adult children of farmworkers pay to reverse histories of decay and "blend into" the professional world.

Jorge: The Quest for "Normal Teeth"

Although Estevan has paid to successfully blend into the professional middle class, Jorge finds that his presentation of self has precluded his ability to similarly "disappear." Instead, Jorge has borne the marks of his childhood lack of insurance all his life. A star athlete and popular high school senior, Jorge feels his one social vulnerability is his stained and crooked smile.

Jorge is the youngest of four children, all born in Mexico. His mother brought him to the Central Valley when he was nine. Now 17, Jorge is a star athlete in nearby Firebaugh High School—he runs track, cross-country, and starts on the wrestling team. He is likely to be

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voted “athlete of the year.” He writes for the school newspaper and is popular among his peers. Yet although Jorge is among the most talented students in his school, he feels this success only thinly disguises an insurmountable social disadvantage—he is undocumented. This stigma becomes most visible in regard to his teeth. “On the outside, most people think that everything is there for me, that everything is good. But when I open my mouth, all that disappears,” he says.

By the time he reached high school, Jorge had never seen a dentist nor a doctor. He only qualified for the limited dental care that state and county programs offer the undocumented, and his mother could not pay for treatment on her farmworking salary of $8,000 a year. Yet participating in sports made physical checkups necessary. “I’m pretty sure we wouldn’t get them otherwise,” he says. In the ninth grade, he received his first physical so that the coach would allow him to run track and cross-country. Although team members with papers had their physicals covered by Medi-Cal, Jorge paid for his out of the savings from his after-school job. Although this form of social disadvantage lies hidden beneath the surface of his everyday life, Jorge says that it becomes particularly apparent when he needs medical care. He feels it acutely as a form of second-class status. He says of his annual checkup: “They just take my height, weight, blood pressure. I’m pretty sure they do more extensive checkups sometimes, but we don’t get them.”

Jorge and his friends rarely discuss the issue of who has and who lacks insurance: income and citizenship status are taboo subjects. Yet at certain moments, he feels his body betrays his social vulnerability. By freshman year, Jorge’s teeth had begun hurting unbearably. Unable to afford a dentist, his mother resorted to a series of *remedios caseros* (home remedies). When he was unable to sleep one night, she doused his teeth with alcohol. When that was unsuccessful, she boiled cloves and made him gargle with the mixture. She had gotten this idea from a Mexican product called “Ciencia de Clavo,” (or “Clove Science”), an over-the-counter dental treatment popular among the rural Mexican poor.

By sophomore year, Jorge’s image of success was literally crumbling before his eyes; his front tooth began visibly breaking. “It had a little hole in the middle of it, and it looked like it wanted to spread to the other tooth,” he says. For months he was too embarrassed to grin or laugh. As luck would have it, help arrived the following year in the form of a dental screening offered through the federal Migrant Program. The Program promised it would remove the decay. Yet it could not erase all the visible signs of Jorge’s social vulnerability. Jorge had developed an overbite, and had one tooth layered on top of the other. Paying for braces, however, was out of the question. “That’s when it became clear that it was going to have to come out of us, and that’s when we stopped the process,” he says.

Jorge will be attending Fresno City College in the fall, a college popular for its low tuition rates for foreign nationals. His family is in the process of naturalizing its legal status. A bright future appears within reach—one certainly brighter than that of his oldest brother, who has found himself consigned to work in the fields. Yet Jorge is concerned that his appearance will come between him and this promising future. In particular, he fears his crooked teeth will prevent him from realizing his eventual goal of becoming a newscaster. He would like to intern at a news organization, but knows that a prerequisite would be strengthening his teeth. And even before he got braces, he would need to correct the long legacy of decay in his mouth, amounting to thousands of dollars of fillings and root canals.

With his after-school job in a corner store, Jorge knows he cannot afford to pay for the corrective dentistry this “normal” appearance requires. Thus, “blending in” remains a dream for Jorge; he can only hope that one day he will be able to pay for the orthodontic work that will finally give him what he calls “normal teeth.”

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Discussion

We suggest that farmworker children's marked physiognomies be viewed as "stigmatized biologies." Margaret Lock's concept, "local biology," raises the issue of local variation in both illness experience and biological process, variation that is itself dependent on environment, diet, and culture (1993). Although anthropologists have long examined the effects of culture and environment on embodiment, we adapt Lock's term to draw attention to the role of insurance policies in similarly shaping children's physical development and embodied selves. This raises the provocative issue of biological variation within national spaces—variation that itself is marked by ethnoracial and class difference. Applying the term to farmworker children in California's Central Valley illustrates the need for attention to the roles of overlapping biocultural, social, and political factors in helping to shape such intranational variations.

The stories of Estevan and Jorge illustrate how the interplay between caregiver practices and insurance policies result in complaints of heightened visibility for farmworker young adults. As Brackette Williams argues (1989), national community is perceived as synonymous with an unmarked ethnoracial group that has the privilege of effortlessly "blending in" with national culture. Estevan's and Jorge's felt difference highlights their embodied inequality, or their perceived sociocultural and stigmatized bodily distance from this unmarked norm. Both see their teeth as a marker of their social vulnerability—a visible sign of their farmworking past. Understandably, their complaints of visibility intensify with the social and physical distance they hope to travel from their roots in Mendota—whether to news studios in Fresno or to the halls of Congress in Washington, DC.

Many scholars have suggested that with the decline of the ideal of social insurance and the rise of market-based medicine, the healthy body has become a symbolic marker of social advantage. The body has become a site through which to project one's social value, and the designer body has become a "commodity" signaling elite citizenship (Porter 1999). Although some suggest a commodification of the body such that desired bodily characteristics become an end point—a goal in themselves—others instead argue that one's value is instead projected in the very process of continually perfecting the physical self. As Petersen and Lupton (1997:27) argue: "It is in the process of working on the self … that one constitutes oneself as a dutiful citizen." Such scholars, thus, suggest that the goal is not necessarily to attain a particular bodily characteristic but, rather, to signal participation in a collective ethos of perfectability. By virtue of their very underinsurance, low income populations are excluded from this culture of continual physical improvement.

For farmworker youths, disfigurement assumes the status of an involuntary bodily marking, one that others can – and do – read as a sign of social vulnerability. For both Estevan and Jorge, their poor oral health is perceived to mark them as irrevocably "different," serving as a detriment to upward social mobility. This is apparent in Estevan's heightened self-consciousness about his teeth with the distance he traveled from his farmworking roots, adopting behaviors excessive even for middle class. Estevan's effort to perfect his body signals his attempt to participate in this collective ethos of perfection. It exemplifies a shift of emphasis within biomedicine from "normalization" to "customization," as medical technologies are deployed to sculpt ever more exquisitely crafted selves (Clarke et al. 2003). Yet the exorbitant price tag for the dental work that Estevan would require illustrates the prohibitive cost of reversing a childhood of poor oral health and unequal access to care. Although Estevan is able to signal elite citizenship by continuously working on his teeth, Jorge's story shows that similar resources are necessary simply to disappear into the category of the "unmarked."

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Conclusion

Scholars of health disparities have recently reinvigorated study into the plasticity of biology, proposing rigorous investigations of how we physically incorporate our social and material environment. Proposing the conjoint social and biological determinants of health, health disparities scholars investigate the biological—not genetic—pathways through which social disadvantage is materialized. Yet they also provocatively show the cumulative effects of social disadvantage, as childhood health disparities play a key role in shaping the long-term health of the individual. Some have shown that adult chronic diseases can be traced to prenatal and childhood environments (Adair and Dahly 2005; Barker 2004), while others have shown that a mother's ill health may affect the health of subsequent generations through the fetal and postnatal environment (Kuzawa 2008). Anthropology should not cede rigorous documentation of health disparities to public health scholars alone. Because of its holistic approach to health—with attention to both social and biological factors—anthropology is well positioned to track the material and lasting effects of public policies.

Although Krieger's concept of "embodiment" allows us to conceptualize how the distinct epidemiological profiles of different populations may be "biological expressions of social relations" (2001:672), ethnographic studies allow us to examine how social determinants of health are manifested as biology. Epidemiology can hypothesize and test associations between social determinants and health disparities, yet ethnography provides the invaluable service of connecting the dots between them. To create effective public health interventions, ethnography must complement epidemiology; a nuanced understanding of how inadequate health care translates into oral health disparities for low-income Latino children is essential.

Moreover, ethnography must document the social consequences of ill health, as social inequality—once embodied—in turn yields further social disadvantage in new and unanticipated ways. Although Mexican American farmworker children's early childhood oral disease sets them up for a lifetime of poor oral health, state insurance policies cement the enduring effects of their social disadvantage. In the case of oral disease, farmworker children's social vulnerability is physically embodied in the form of malformed arches and crooked teeth. Attention to the issue of insurance illustrates the way that our current health care system serves to reproduce existing social inequalities, as an underfunded dental public health care system may in turn compromise prospects for the future. This may in turn create a larger and more "visible" group who bear the outward marks of their underinsurance, finding their upward social mobility hindered by their distinctive bodily markings.

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