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THEM THAT HAS,¹ GETS²

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In 2004, sociologists Robert Sampson and Jeffrey Morenoff published a remarkable study on the persistence of poverty in Chicago neighborhoods from 1970 to 1990.³ The authors made several important findings. First, those neighborhoods that were poor in 1970 were almost all poor twenty years later in 1990.⁴ Even as poverty rates dramatically increased in those neighborhoods throughout the period, the neighborhoods' rankings stayed the same—that is, the poorest neighborhoods in 1970 were also the poorest in 1990, only significantly more so. Likewise, poverty rates increased most in those neighborhoods that were already poor, and less so in neighborhoods that did not suffer already from high poverty rates. Over time, neighborhood rankings remained remarkably stable despite the turn-over of families and individuals.⁵

Second, and not surprisingly, race was closely correlated both to increasing poverty and to a neighborhood's position in the rankings. In 1970 and in 1990, poverty was highest in the neighborhoods that formed the core of the city's historic black belt: Grand Boulevard, Oakland, Woodlawn and Englewood to the south, and Garfield Park and North Lawndale along the

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1. *This draft chapter is part of a larger book project entitled "Locked In Apartheid." The book develops a theoretical model—the lock-in model of racial inequality—to explain why racial disparities have persisted even after the passage of civil rights laws that prohibit intentional discrimination. The model draws on theoretical work from antitrust and complex systems theory that explains how market monopolies can persist over time, even after the monopolist has stopped engaging in intentional, anti-competitive activity.*

Applied to race, the lock-in model proposes that, just as Microsoft's monopoly has persisted long after the end of its illegal conduct, so too can white "racial monopoly" persist even in the absence of intentional discrimination. In outlining the model, the book advances three central and related arguments. First, during the era of slavery and Jim Crow, whites formed racial cartels (like neighborhood homeowners' associations) to anti-competitively exclude blacks and Latinos from many areas of economic, political and social life. Owing to this anti-competitive conduct, whites gained a significant monopoly advantage in housing, education, employment and wealth, among other areas. Second, this early monopoly advantage now has begun to reproduce itself over time, primarily by way of institutional "feedback loops" that parlay early advantage into continuing and self-reinforcing advantage. For example, white advantage in wealth and housing may reproduce itself via differential access to well-funded schools. Third, white racial advantage may now have become locked in place. That is, white advantage may be sufficiently large and self-reinforcing that blacks and Latinos will not be able to close the gap, absent massive government intervention. This chapter focuses on the second component of the model. It describes the dynamics of institutional feedback loops and the role they play in the lock-in model of inequality.

2. Matthew 25:29 (from the parable of the three servants, "To him who hath shall be given and from him who hath not, shall be take away even what he hath.").

3. Robert J. Sampson & Jeffrey D. Morenoff, *Durable Inequality: Spatial Dynamics, Social Processes and the Persistence of Poverty in Chicago Neighborhoods*, in *POVERTY TRAPS* (Samuel Bowles, Steven Durlauf & Karla Hoff eds., 2004).

4. *Id.* at 4 (The correlation coefficient for neighborhood poverty rankings and rates from the year 1970 to 1990 was 87).

5. *Id.* at 5 (Poverty rates for the average neighborhood studied increased from 11 to 20 percent).

city's western corridor. The data also suggested a tipping phenomenon: neighborhoods that initially were at least 40 percent black remained black and poor or became blacker and poorer.⁶ Although the presence of Latino residents was not initially linked to poverty in 1970, over time, the number of Latinos in a neighborhood increasingly predicted higher poverty rates.⁷

Third, certain key institutional structures in a neighborhood were linked to poverty. The number of homeowners and physical proximity to a poor black neighborhood were significantly correlated to a neighborhood's poverty rate. Neighborhoods that had the fewest homeowners and were located closest to the black belt experienced the most dramatic increases in poverty rates. These structural features were linked, in turn, to the race of the neighborhoods' residents.⁸

Sampson and Morenoff's findings raise several key questions about the nature of racial inequality. Why does racial poverty persist or increase over time, even after the passage of anti-discrimination laws? Why are racial inequalities in housing, education, employment and wealth linked to residential location and space? Most importantly, how do our institutional rules—those taken-for-granted rules that govern the workings of the neighborhood, the school house and the workplace—contribute to continuing racial poverty?

This chapter argues that “positive feedback loops” in institutional processes play a central role in perpetuating race and poverty.⁹ In a negative feedback loop, change in one direction triggers change in an opposite direction, which usually produces some sort of equilibrium. For example, in response to a drop in body temperature, humans shiver, in order to heat the body back up to its normal temperature. In economic markets, when demand for goods increases, supply goes down, and prices rise. Ultimately demand slows in response to rising prices, until the price reaches equilibrium.

In a positive feedback loop, a change in one direction leads to more change in that same direction. A snowball gathers more snow. The population explodes. A bank account accumulates wealth exponentially. Positive feedback loops amplify earlier conditions because change in one direction feeds back to produce more change in the same direction. Each increase leads in turn to further increase, and each decrease produces a further decrease.

Positive feedback loops play an important but overlooked role in reproducing historical racial inequality over time. Many of the taken-for-granted, race-neutral arrangements that structure our contemporary social

6. *Id.* at 22.

7. *Id.* at 7-8, 12 (black neighborhoods and Latino trends).

8. *Id.*

9. Importantly, this chapter does not suggest that individual and intentional discrimination play a minimal role in persistent inequality. Indeed, evidence abounds that racial steering, redlining and other forms of intentional institutional discrimination remain a significant factor in explaining racial disparities. At the same time, this chapter suggests that even if intentional discrimination (both individual and institutional) were to disappear tomorrow, structural inequality would persist.

institutions create positive feedback loops, in which the rich get richer and the poor get poorer. In school districts, local public schools get a big part of their funding from local property taxes. In workplaces, employers hire candidates through word-of-mouth informal referrals. In families, parents who can afford the expense take out home equity loans to pay for their children's college tuition.

When these feedback loops are set against the historical background of racial exclusion, they serve to reproduce the racial monopoly power of slavery and later exclusion. Consider the example of neighborhood capital—the extra wealth that a household accumulates from the wealth of its neighbors. One might think of this process as a process that reproduces class and not race inequalities. But given the country's history, this feedback loop serves to reproduce the initial monopoly advantage that whites acquired by way of early anti-competitive conduct.

More precisely, during the era of exclusion, white real estate boards, homeowners' associations and private lenders worked together to exclude certain racial groups from bidding to buy housing. These racial cartels deployed a range of anti-competitive strategies to create segregated neighborhoods, which concentrated in one space people who earned less income and wealth and possessed less education (owing to historical discrimination in employment and schools).¹⁰

Forty years after Congress passed anti-discrimination laws, these segregated neighborhoods now continue to reproduce racial inequality through the feedback loop of neighborhood effects. The neighborhood in which a person lives strongly affects her life chances. In turn, her life chances contribute to the welfare of the neighborhood.¹¹ Deteriorating neighborhoods can condemn their residents to likely poverty, just as transitional neighborhoods can lift the chances of its residents as the neighborhood rises. The better-off the neighborhood, the better-off the resident, which in turn makes the neighborhood better-off, etc. In this way, neighborhood effects can reproduce inequality at the level of the neighborhood over many generations, even in the absence of continuing discrimination.

Like neighborhood effects, most of the feedback loops discussed here perpetuate disparity without intentional discrimination. After all, whites may be moving to wealthier, predominantly white neighborhoods not to flee black or Latino neighbors but to benefit from well-financed schools, wealthy neighbors and stable property values. Because whites who are

10. See DAVID ROEDIGER, *THE WAGES OF WHITENESS: RACE AND THE MAKING OF THE AMERICAN WORKING CLASS* (Verso 1999).

11. See DEIDRE A. ROYSTER, *RACE AND THE INVISIBLE HAND: HOW WHITE NETWORKS EXCLUDE BLACK MEN FROM BLUE-COLLAR JOBS* (Univ. of California Press) (2003). Royster's work, which is discussed later in the this chapter, traced the employment histories of black and white graduates from the same high school over a period of five years. Over and over, white men looking for work were helped by older white men in their social networks (fathers, shop teachers, neighbors, friends of the family) who had connections with unions or employers, while black men had no access to such connections. Royster's data indicates that social networks, particularly family and neighborhood networks, function to reproduce employment stratification along racial lines.

looking to trade up are not necessarily motivated by intentional prejudice, contemporary anti-discrimination law does not prohibit their choices (a point that Chapter 5 will discuss at length). At the level of the collective group, however, these choices perpetuate racial inequality.

The rest of this chapter explores the institutional feedback loop in greater detail. The next section looks at the structure of the institutional feedback loop, and the underlying theory. The following section outlines four general categories of feedback loops that reproduce racial inequality—family transfers of wealth, network effects, space and geography, and coordination standards.

I. INSTITUTIONAL FEEDBACK LOOPS: SOME BASIC THEORY

The concept of the institutional feedback loop draws from some fascinating work in complex systems theory. Complex systems theory is an interdisciplinary field that studies the dynamics and structure of complex systems. Complex systems are made up of individual agents that interact with each other to produce unpredictable and interesting patterns. These patterns cannot be understood simply by looking at the behavior of individual agents. The whole is indeed far more than the sum of its parts. The world is full of complex systems. Ant colonies, stock markets, families, star systems, neighborhoods, and sand piles are all amazing examples of systems.

For example, the ant colony's move to relocate after a flood cannot be predicted from the behavior of the individual ant, just as the stock market's complex dynamic patterns cannot be reduced to the behavior of buyer or seller (or even just the interaction of the two in a Prisoner's Dilemma). Something distinct happens at the level of the complex system, and complex systems theorists look for rules common to all complex systems to help explain what that something is.¹²

Many complex systems exhibit very similar dynamic patterns. For example, complex systems often experience "phase transitions," in which change is sudden, non-linear and unpredictable. The stock market crashes and bubbles, even as it moves slowly in other periods. Water boils and then escapes into steamy vapor. An ant colony suddenly goes into breeding mode. The racial composition of neighborhoods can change quite rapidly once the numbers reach a certain threshold or "tipping point."¹³

12. For a highly readable introduction to complex systems theory, including the narrative of the genre's evolution, see generally WALDROP, *COMPLEXITY: THE EMERGING SCIENCE AT THE EDGE OF ORDER AND CHAOS* (Simon & Schuster 1992). For a more technical discussion of the principles of complex systems, see generally ROBERT AXELROD & MICHAEL COHEN, *HARNESSING COMPLEXITY: ORGANIZATIONAL IMPLICATIONS OF A SCIENTIFIC FRONTIER* (Free Press 2000); for an introduction somewhere in the middle, see Brian Arthur, *Why Do Things Become More Complex?*, *SCIENTIFIC AMERICAN*, May, 1993, at 144.

13. In physical systems, such points are often referred to as phase transitions. For example, when water moves from frozen form to fluid, the phase transition takes place within the context of a small increase in temperature. Other complex systems display tipping points, critical thresholds and other phenomena in which small differences create large changes. A small outbreak of an infectious disease suddenly becomes an epidemic. The centuries-old practice of foot binding disappears over thirty years.

This non-linear change is often produced by a dynamic process known as a positive institutional feedback loop. In an institutional feedback loop, an initial change to the system produces more change to the system and moves it in the same direction. When the system's "output" feeds back to become part of the system's "input," change accelerates over time. In a compound interest bank account, for example, the account grows dynamically because output (the interest) feeds back into input (the account's capital) during the next period. Assuming no withdrawals, the account grows exponentially larger, even in the absence of further deposits.¹⁴ Likewise, when the population grows, each new generation feeds back to become the parents of the next generation.

Brian Arthur uses the mathematical example of the Polya urn process to illustrate the way in which feedback loops reinforce the effect of earlier events.¹⁵ At the outset, the urn contains only two balls, one red and one white. For each round of play, an experimenter randomly draws a ball and then returns it to the urn, together with another ball of the same color as the ball drawn. Draws and returns proceed until the urn is filled. The key mechanism—adding another ball of the same color as that drawn—is a positive feedback loop, because it reinforces the effect of each previous draw, particularly those early in the process.

In the world of economics, positive feedback loops can take the form of increasing returns. Neo-classical economists have always assumed that the economy is governed by negative feedback loops, where the effect of change is dampened as the system moves toward equilibrium.

As early as the 1950s, however, economists like Gunnar Myrdal and Nicholas Kaldor described positive feedback loop mechanisms—in Myrdal's words, "circular and cumulative causation"—that depart from these conventional principles. These scholars, and now a new generation of economists, have pointed out that certain markets are sometimes characterized by increasing returns, in which market success is cumulative and self-reinforcing.¹⁶

In the context of monopolies, increasing returns can amplify the advantage of a market monopolist, even after the bad actor has stopped engaging in illegal conduct. Some commentators have argued, for example,

For a very readable description of this particular feature of complex systems, *see generally* MALCOLM GLADWELL, *THE TIPPING POINT: HOW LITTLE THINGS CAN MAKE A BIG DIFFERENCE* (2d ed. 2004). For a more scientific description of phase transitions, tipping points and critical threshold, *see generally* MOSHE GITTERMAN & VIVIAN H. HALPERN, *PHASE TRANSITIONS: A BRIEF ACCOUNT WITH MODERN APPLICATIONS* (World Scientific Publishing Co. 2004).

14. *See* W. BRIAN ARTHUR, *Increasing Returns and the New World of Business*, 74 HARV. BUS. REV. 100, 102 (1996); Mark Lemley & David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479, 500-507 (1998).

15. *See* W. BRIAN ARTHUR, *INCREASING RETURNS AND PATH DEPENDENCE IN THE ECONOMY* 6 (Univ. of Michigan Press 1994).

16. GUNNAR MYRDAL, *ECONOMIC THEORY AND UNDERDEVELOPED REGIONS* x (Harper & Row 1971) (1957); NICHOLAS KALDOR, *CAUSES OF THE SLOW RATE OF ECONOMIC GROWTH IN THE UNITED KINGDOM* (Cambridge Univ. Press 1966); *See also* Nicholas Kaldor, *The Case for Regional Policies*, 17 SCOTTISH J. POL. ECON. 337 (1970).

that a positive feedback loop reproduced Microsoft's unfair advantage in the operating systems market even after Microsoft had ceased its anti-competitive behavior.¹⁷ Early in the formation of the market, Microsoft had engaged in anti-competitive conduct (e.g., bundling, illegal tying contracts and exclusive contracts), which conferred an unfair competitive advantage in the operating systems market.

Microsoft's unfair advantage then persisted over time because of an institutional feedback loop connecting software authors to consumers. Because software authors wanted to write software for the most popular operating systems, more software authors wrote programs for Windows as the system became more popular. In turn, because consumers wanted to buy the operating system that had access to the widest range of software, any increase in available software triggered a corresponding increase in consumers. Each increase in software authors triggered an increase in consumers, which in turn, triggered a corresponding increase in software authors, thereby producing more change. Microsoft's advantage became self-reinforcing over time, long after Microsoft had stopped its illegal behavior.

Like the operating systems market, systems with institutional feedback loops display several characteristic qualities. *First*, they can be "path dependent." That is, they can be very sensitive to historical events, particularly those that happen early in the formation of the system.¹⁸ For example, if early draws in the Polya urn happen by chance (or by manipulation) to be mostly of one color, then the urn may ultimately "tip" to that color over time.

In an oft-cited example of this idea, economists trace the dominance of the standard Sholes QWERTY typewriter keyboard to two minor historical events. First, a number of typing schools decided to use the Sholes keyboard to develop a typing course. Second, a typist using the keyboard scored a decisive victory in a typing contest in 1888. These relatively minor events gave the Sholes keyboard a competitive lead in the market, early on in the formation of the industry.¹⁹

17. For a vigorous defense of Microsoft's conduct, a challenge to the lock-in argument and an argument that Microsoft's dominance can be traced to a better product, see generally STANLEY J. LIEBOWITZ & STEVEN E. MARGOLIS, *WINNERS, LOSERS AND MICROSOFT: COMPETITION AND ANTI-TRUST IN HIGH TECHNOLOGY* (Independent Institute 1999).

18. Scott Page correctly points out that increasing returns do not necessarily lead to path-dependence, monopoly or lock-in. In the event that two or more technologies can take advantage of increasing returns at roughly the same rate, then those technologies may remain competitive with one another, and small historical events will not necessarily affect market outcomes. Scott E. Page, *An Essay on the Existence and Causes of Path Dependence* (unpublished essay, Univ. of Michigan) (on file with author).

19. See Paul A. David, *Understanding the Economics of QWERTY: The Necessity of History*, in *ECONOMIC HISTORY AND MODERN ECONOMICS* 30-49 (William N. Parker ed., 1986). See also Paul David, *Clio and the Economics of QWERTY*, 75 *AM. ECON. REV.* 332, 332-34 (1985); Paul David, *Why Are Institutions the "Carriers of History?"* *Notes on Path-Dependence and the Evolution of Conventions, Organizations and Institutions*, 5 in *STRUCTURAL CHANGES & ECONOMIC DYNAMICS* 205 (1994). For an argument against QWERTY as an example of path-dependence, see Leibowitz & Margolis, *supra* note 17.

An institutional feedback loop then translated that early lead into a self-reinforcing advantage. Like the software authors in the Windows example, new typists were eager to train on the most popular keyboard. In turn, employers wanted to buy the keyboard that would give them access to more trained typists. Each increase in Sholes typists triggered an increase in employers who bought the keyboard, which thereby persuaded more typists to train on it, and so on.

Importantly, this process also created barriers to entry for competitor keyboards. Given limited resources, employers adopted only one kind of keyboard, and typists were likely to train on only one keyboard as well. Thus, as more employers adopted QWERTY keyboards, this worked not just to the advantage of Sholes and Sholes employers and typists, but also to the disadvantage of competitor keyboards, typists and employers. In this way, both advantage and relative disadvantage became self-reinforcing over time. Eventually, the Sholes keyboard monopolized the market.²⁰

Second, once the system has charted a particular direction, systems with positive feedback loops may become inflexible. In the Polya urn, once the urn has begun to tip towards one color, later draws may have very little effect on the ultimate distribution of balls in the urn. The same idea is illustrated in the VCR market. In the competition between the Betamax and VHS video recorders in the 1970s and 80s, small market fluctuations favored the VHS format manufactured by JVC, even though both Sony and JVC began with roughly the same market share. After VHS had gained a sizable lead, the VHS advantage accelerated because video outlets began to exclusively carry VHS tapes, which made that format even more popular. Ultimately, the market became inflexible when Beta could no longer catch up to VHS.²¹ At this threshold or “tipping point,” we say that VHS had become “locked in.”

Third, markets with feedback loops are potentially inefficient. Because a product’s success is sometimes linked to accidental (or intentional) advantage, the market can potentially lock in an inferior technology. Some commentators argue that Betamax is technically superior to VHS, and that the feedback process has locked in the relatively less efficient format.²² Of

20. Scott Page has argued that the relative disadvantage or “negative externalities” created by the QWERTY feedback loop are what drive path dependence, and not positive externalities. See Page, An Essay, *supra* note 18. In my view, Page’s argument confuses the issue. First, it is the positive feedback loop—positive in the sense not that it confers benefits but that it produces movement in the same direction—that creates both positive and negative externalities. Second, I would argue that in most real-world cases, both the negative externalities experienced by competitor keyboards and the positive externalities enjoyed by QWERTY are incident to the same institutional feedback loop. To be sure, in the theoretical world, feedback loops could create positive externalities or effects—effects that benefit one competitor—without creating negative effects on competitors. But practically speaking, in a world of limited resources, any feedback loop that confers positive benefits on a dominant market player is likely also to confer negative effects on competitors in the same market.

21. Michael A. Cusumano, Yiorgos Mylonadis, and Richard S. Rosenbloom. *Strategic Maneuvering and Mass-Market Dynamics: The Triumph of VHS over Beta*, 66 BUSINESS HISTORY REVIEW 51 (1992); see also W. Brian Arthur, *Positive Feedbacks in the Economy*, 262 Scientific American 92 (1990); Arthur, *supra* note 14, at 2.

22. *Id.* at 112.

course, self-reinforcing dynamics do not *necessarily* produce an inefficient or sub-optimal outcome. In fact, self-reinforcing effects might actually reproduce the advantage of the more innovative alternative, given the right circumstances.

II. FEEDBACK LOOPS THAT REPRODUCE RACIAL INEQUALITY

What can monopoly in typewriter keyboards and computer operating systems teach us about contemporary race relations? Just as institutional feedback loops have sustained Sholes' and Microsoft's monopoly on the markets, so too have institutional feedback loops sustained an early racial monopoly on resources and opportunities. And, like the locked-in monopoly that characterizes some high-tech markets, racial disparities appear to be firmly entrenched and potentially inefficient.

The story of persistent racial monopoly has its beginnings in slavery and later eras of racial exclusion. As Chapter 2 describes, whites formed a variety of racial cartels during slavery and afterwards to anti-competitively exclude certain communities of color. Planters' unions, real estate boards, neighborhood homeowners' associations, and industrial labor unions formed to exclude blacks from neighborhoods, employment, schools, and a wide range of other institutional resources and opportunities. Likewise, corporate ranches and concerned citizens' councils (as well as many of the cartels named earlier) formed to exclude Mexicans during the turn of the century.²³ These cartels engaged in a wide range of anti-competitive behavior—simple economic pressure all the way through to violence, murder and property destruction.²⁴ At the end of the era of exclusion, whites enjoyed a “monopoly surplus” in opportunities and resources—wage premiums from a white monopoly on the best jobs, superior housing at lower prices from a monopoly on housing, and well-financed schools at lower tax rates from a monopoly on education, among others.

This chapter argues that four different types of institutional feedback loop now have parlayed that early competitive advantage into a continuing advantage: family transfers of assets, geography and legal space, standard setting and network effects. *Family transfers of assets* can build on whites' early material advantage. Owing to exclusion, whites have had more wealth, and for a longer period of time, than have non-whites. White families have been able to invest this surplus to generate wealth for their children: making a down payment on a house, paying for college tuition or setting up a business. Because wealth begets wealth, and because wealth has been racially defined, racial wealth inequalities persist over time.

Geography and legal space can do a lot to parlay whites' material advantage as well. Historical segregation concentrated much of whites' early

23. As noted earlier, and as more fully described in Chapter 2, other racial groups did not suffer the same degree of anti-competitive exclusion as did blacks and Latinos. In addition, other immigrant groups came with more human capital or actual capital than did either of these two groups.

24. See Chapter 2's discussion of the monopoly strategies deployed by racial cartels during Jim Crow and slavery.

wealth advantage into distinct geographical spaces. Well-defined white neighborhoods had the monopoly on wealthy neighbors, stable property values and public goods like school financing. Because neighborhood effects translate that early monopoly into continuing advantage, space can reproduce the segregation surplus acquired during earlier periods of exclusion.

Likewise, *standard setting* can serve to reproduce white procedural and political advantage. During earlier times, white employers and unions filled certain high-wage workplaces with white workers, and whites controlled “the workplace standard” for compatibility. Owing to compatibility and coordination concerns, employers now have an economic incentive to “standardize” by hiring workers who will be compatible with existing white workers. Because whites engaged in bad behavior to become the first movers in the best workplaces, any standard that promotes compatibility will continue to favor them.

Finally, *network effects* can work to reproduce whites’ early structural advantage. Network connections, like social connections in general, provide access to a wide range of resources and opportunities. Benefitting from their early monopoly behavior, whites’ networks enjoyed far more resources than non-whites: connections to high-paying jobs, to valuable commercial information, and to cultural and financial capital, among other things. Segregated networks of contact now reproduce themselves and the differences in access to resources.

As the following chapter will discuss, the law plays an important role in structuring all four feedback loops. For example, estate tax laws regulate the amount of family wealth that can be passed down to subsequent generations without being subject to taxation. Zoning law and public school finance regulations control who occupies what geographic space, and the type of benefits associated with that space. Anti-discrimination and employment law regulate the parameters of organizational choices to standardize. A wide range of law, including employment law, determines what resources can be distributed through informal networks.

A. *Family Transfers of Assets to Generate Future Wealth*

Although the racial gap in income has closed very slightly in recent history, the gap in wealth between races remains huge—seven times greater than the gap in income. According to recent studies, the net worth of a typical black family falls between 10 to 20 percent of the net worth of a white family.²⁵ As of 1999, the typical black family had a net worth of

25. These results hold true in studies that control for income and other factors. See THOMAS M. SHAPIRO, *THE HIDDEN COST OF BEING AFRICAN AMERICAN: HOW WEALTH PERPETUATES INEQUALITY* 47 (Oxford Univ. Press 2004); MELVIN L. OLIVER & THOMAS M. SHAPIRO, *BLACK WEALTH / WHITE WEALTH: A NEW PERSPECTIVE ON RACIAL INEQUALITY* 7 (Routledge 1997) (reporting 15 percent); Francine D. Blau and John W. Graham, *Black-White Differences in Wealth and Asset Composition*, 105 Q. J. ECON. 321, 321 (1990) (reporting 18 percent).

\$8,000, compared to \$81,000 for a white family.²⁶ Similar figures for 2002 put the average net worth of a Latino family at \$7,932.²⁷ Moreover, the wealth gap for both groups seems to grow much larger during economic downturns.²⁸

How much of this racial wealth gap can be traced to the white monopoly surplus from earlier periods of exclusion? In general, a significant portion of a person's wealth can be traced to family wealth that is passed from generation to generation. Laurence Kotlikoff and Larry Summers have estimated that eliminating inter-generational transfers would reduce U.S. wealth by as much as 50 percent.²⁹ Predictably, these transfers contribute quite a bit to the modern racial wealth gap, particularly because the very wealthy make very big transfers, and the very poor make very small transfers, if they make transfers at all.³⁰

Recent research by sociologist Dalton Conley has confirmed that family transfers play a big role in reproducing the racial gap. Conley's study looked at data from several generations to determine how much of the racial wealth gap could be explained by differences in parental net worth. After controlling for a number of other potential explanations, Conley found that racial differences in parental wealth accumulated over time, and these differences were the most important factor in explaining the contemporary racial wealth gap.³¹

Economist James Curtis has traced the source of the black-white wealth gap even further back to the accumulation of historical wealth during slavery. Curtis's research compared historical racial differences in wealth before the end of the Civil War to modern racial differences in wealth. Curtis's study made two important findings. First, wealth differences among blacks in the years between 1860 to 1870 could all be explained by legal status—whether the person in question was free or enslaved. Second, modern wealth differences between blacks and whites could be traced to the compounding growth rate of wealth passed from

26. See SHAPIRO, *supra* note 25, at 47.

27. Rakesh Kochhar, *The Wealth of Hispanic Households, 1996-2002*, Pew Hispanic Center Rep. 2 (October 2004).

28. Dalton Conley, *Decomposing the Black-White Wealth Gap*, 71 SOC. INQ. 39 (2001) (citing to Oliver and Shapiro).

29. Laurence J. Kotlikoff & Lawrence H. Summers, *The Contribution of Intergenerational Transfers To Total Wealth: A Reply*, (NBER Working Paper No. 1827) (Feb. 1986) (reviewing evidence accumulated after 1981); See also Laurence J. Kotlikoff & Lawrence H. Summers, *The Role of Intergenerational Transfers in Aggregate Capital Accumulation*, 89 J. POL. ECON. 706, 730 (1981) (intergenerational transfers are the "major element determining wealth accumulation" in the U.S.; eliminating intergenerational transfers would reduce wealth by \$3 trillion).

30. See OLIVER & SHAPIRO, *supra* note 25, at 169 (wealth transfers matter most at the top and bottom of wealth spectrum).

31. Conley's analysis controlled for income, occupation, age, family structure, education and a host of other demographic variables that might affect an individual's net worth. DALTON CONLEY, *BEING BLACK, LIVING IN THE RED: RACE, WEALTH AND SOCIAL POLICY IN AMERICA* 47 (Univ. of California Press 1999).

generation to generation. Like Conley, Curtis concluded that initial historical differences in wealth during the era just after slavery are responsible for much of the modern racial gap in wealth.³²

Passing down family money reproduces disparity in a variety of ways. This section considers two types of intergenerational transfers in particular: first, parental help to make a down payment to buy a house, which generates more wealth via home equity, and second, parental help with college tuition, which boosts a child's future earnings and wealth as well.

Home ownership is a significant part of family wealth, mostly because home equity appreciates over time. By some estimates, home equity makes up more than a third of a household's non-pension wealth.³³ But racial gaps in wealth distribution exist here as well. Although home equity wealth gets more evenly distributed than, say, stocks or trusts, huge racial gaps in rates of home ownership. The 2000 Census reports that 71 percent of whites owned homes, but only 46 percent of black and Latino households were homeowners.³⁴ Other research reports a similar race gap in home equity.

What explains these racial differences? Economists Kerwin Charles and Erik Hurst have argued that racial differences in getting help with the down payment can explain a big part of the gap. The authors note that 27 percent of whites get parental help in making a down payment to purchase a house, compared to only 7 percent of blacks.³⁵ According to their research, a full 25 percent of the racial gap in home ownership can be explained by the racial differences in parental help.³⁶

The amount of help varies between races as well.³⁷ Not surprisingly, families who cannot get down payment help are less likely to even apply for mortgages, even when they have sufficient income to make the monthly payments.³⁸ Alternatively, they buy homes later than those who get assistance, thus losing valuable time to enjoy equity appreciation. Other research suggests that racial differences in inheritance (which often are connected to the family home) also contribute to wealth inequality.³⁹

Thus, getting help with buying a house can make a big difference in the wealth of racial groups over time. The racial gap in down payment

32. James Curtis, *Long-Run Differences in Wealth Among Blacks and Whites: Empirical Results from Structural Regression Decomposition* 18 2001 ANN. MEETING OF THE SOC. SCIENCE HIST. ASS'N MEETINGS, Chicago, Illinois.

33. Erik Hurst, Ming Ching Luoh, & Frank P. Stafford, *The Wealth Dynamics of American Families, 1984-1994*, 1 Brookings Papers on Econ. Activity (1998).

34. Census of Housing, Homeownership by Race and Hispanic Origin, (2000).

35. Kerwin Charles and Erik Hurst, *The Transition to Home Ownership and the Black-White Wealth Gap*, 84 REV. ECON. & STATISTICS 281, 295 (2002). Thomas Shapiro estimates that 46 percent of whites get assistance in some form, versus 12 percent of black families. SHAPIRO, *supra* note 25, at 112.

36. See Charles & Hurst, *supra* note 35, at 295.

37. See *id.*

38. See *id.* at 292.

39. Suzanne D. Withers & Carolina Reid, *Racial Differences in Intergenerational Wealth Transfers and Access to Homeownership*, Annual Meetings of the Population Association of America (Philadelphia).

assistance is further aggravated by the fact that wealthier homeowners own bigger houses on more desirable property, and thus accumulate even more wealth.⁴⁰ Making the gap even larger, white homeowners were uniquely able to take advantage of the dramatic rise in home values during key historical periods, including the 1970s.⁴¹

Beyond helping with down payments, families also help their children pay for college tuition, which also serves to generate future wealth. As anyone who has priced college tuition knows, in college financing, a family's wealth matters far more than its income. Indeed, in an era when college costs have skyrocketed, families frequently take out home equity loans or draw on other financial assets to pay for college.⁴²

Here again, however, social science evidence documents a big racial gap in family ability to help with college tuition. Dalton Conley's research has looked at the link between parental wealth and college attendance. In particular, Conley examined racial differences in parental wealth and post-secondary education; completing a baccalaureate degree; and completing a graduate degree. In dissecting racial differences, Conley found that family wealth was strongly linked to whether a person pursued a post-secondary education and completed an initial undergraduate degree, although less so for the graduate degree. According to his study, doubling of parental assets raised the probability of a child going to college by 8.3 percent, and the likelihood of graduating by 5.6 percent. Conley found that after controlling for parental wealth and other class characteristics, blacks were actually more likely than whites to continue on to college.⁴³

Of course, family members provide a very important source of social capital to enable people to accumulate wealth. Beyond paying for college or the down payment on a house, family members often choose residential location and help children to find their first job. As the next several sections will discuss, neighborhood choices and job help from network connections represent other types of positive feedback loops.

B. *Geography and Space: Neighborhood Effects*

A second type of feedback loop reproduces inequality through geography and space. Space is important not just because the physical organization of space or its intrinsic characteristics—nearness to a river or natural resources—but also because of the bundle of legal and social benefits that become linked to that space. In the last decade, experts have begun to study the feedback loops that connect geographic space to industry location and economic growth. Economists Paul Krugman and Brian Arthur have argued that a firm's to migrate to a city is influenced not just by its physical

40. Charles & Hurst, *supra* note 35, at 284.

41. OLIVER & SHAPIRO, *supra* note 25, at 148.

42. CONLEY, *supra* note 31, at 58.

43. Dalton Conley, *Capital for College: Parental Assets and Postsecondary Schooling*, in SOCIOLOGY OF EDUCATION 59, 66-68 (2001) (reporting an advantage of .23 to .32 years of schooling). *See also* CONLEY, *supra* note 31, at 68 (reporting the same result for high school attendance and completion).

characteristics, but also by the firm's prospective neighbors—i.e., the earlier location choices of other firms.

The presence of good neighbors adds a great deal to the attractiveness of a location. For example, having other high-tech neighbors in Silicon Valley might also mean having a ready supply of skilled labor and transportation infrastructure. These neighborhood benefits are self-reinforcing. Each new “good neighbor” makes it more likely that the place will attract other good neighbors, at least until the area gets too crowded or competitive.⁴⁴ Thus, industrial location choices can be self-reinforcing.

Neighborhood effects work not just for industrial neighbors but for residential neighbors as well. Legal scholar Lee Fennell notes that choosing a residential location includes not just the physical structure (the residence) of the location, but also a basket of other neighborhood amenities—a particular set of neighbors, and a particular basket of local public goods both from one's own jurisdiction and from others nearby. (For example, a certain residential location might offer so-so public schools and easy driving distance to workplaces nearby.) Fennell also notes that the basket of neighborhood amenities is not an ala carte menu: a resident has to take all of the amenities associated with a particular space, and cannot divide them up. She also notes that these neighborhood amenities can include not just benefits but liabilities as well.

This basket of benefits and liabilities, which the literature refers to as “neighborhood effects,” often affects the wealth of future generations, and not just that of the immediate family. Parents choose a neighborhood with an eye toward the future, and for good reason. Research on the Gautreaux Assisted Housing Program examined the effect of moving 7100 black residents to wealthier white suburban neighborhoods. The results of the study confirm that living in a “good neighborhood”—with wealthy neighbors, well-maintained property, good security services and good schools—generates additional wealth for the individual family and future wealth for children, particularly in terms of attending college and getting good jobs. Living in a “bad” neighborhood with concentrated poverty often means the loss of opportunity and a cycle of disadvantage, both for the neighborhood and the individual residents.⁴⁵

Scholars have studied the effects of a wide variety of neighborhood effects: local public finance, income distribution in the neighborhood, and neighbors' property improvements, to name a few.⁴⁶ These studies confirm

44. Paul Krugman, *History and Industry Location: The Case of the Manufacturing Belt*, 81 AM. ECON. REV. 80 (1991); Arthur, *supra* note 14, at 49-67.

45. Leonard Rubowitz and James Rosenbaum documented the results from the Gautreaux Assisted Housing Program, which moved over 7,100 black families to the Chicago suburbs as part of a consent decree. These scholars found that for those families who moved to the suburbs, 54 percent of the children from those families enrolled in college, versus 21 percent of the control group who used their Section 8 benefits to stay in the city. Recent follow-up research has confirmed that these differences have persisted. LEONARD RUBINOWITZ & JAMES ROSENBAUM, *CROSSING THE CLASS AND COLOR LINES: FROM PUBLIC HOUSING TO WHITE SUBURBIA* (Univ. of Chicago Press 2000).

46. For studies looking at public finance, see Steven Durlauf, *Neighborhood Feedbacks, Endogenous Stratification and Income Inequality*, in *DYNAMIC DISEQUILIBRIUM MODELING* (W. Barnett, G.

several important points. First, a family's welfare is closely tied to that of the neighbors. Research finds, for example, that a child's success in school depends heavily on what her classmates are like, and in particular their socio-economic status.⁴⁷

Second, neighborhood effects operate to sort neighborhoods over time. More specifically, differences in neighborhood amenities tend to sort neighborhoods by housing price, rental price, local property taxes and zoning barriers (which impose minimum price requirements). Neighborhood effects like public expenditure also tend to sort neighborhoods by race. The following discussion focuses on public school financing, to explain how neighborhood differences can persistently stratify neighborhoods by race.

As any family looking to buy housing (or real estate broker) can testify, people pay very close attention to schools and school finance in choosing where to live. Homeowners who are not parents pay attention because of the effect of schools on property values. Those who are parents pay attention because they know that going to the "right school" will help to determine their children's future success.

Why is going to the right school essential to a child's future? The answer seems obvious. Well-funded schools do a better job at improving the cognitive skills of students, and employers are more likely to hire a candidate who has better skills. But good schools can make a difference to future wealth in many other ways. First, graduating from a good school (which presumably requires more work in class or at home) signals that a job candidate cares about status, and will try to excel, or at least try to avoid being fired.⁴⁸

Second, going to school in a middle-class white neighborhood signals that the job candidate has been socialized according to the norms of behavior characteristic of the white middle-class community. Employers might find this important if the workplace is already predominantly white and

Gandolfo & C. Hillinger eds., Cambridge Univ. Press 1996); Steven Durlauf, *A Theory of Persistent Income Inequality*, 1 J. OF ECON. GROWTH 75 (1996); Raquel Fernandez & Richard Rogerson, *Income Distribution, Communities and the Quality of Public Education*, 111 Q. J. OF ECON. 135 (1996); Thomas Nechyba, *Existence of Equilibrium and Stratification in Local and Hierarchical Tiebout Economies with Property Taxes and Voting*, 10 ECON. THEORY 277 (1997). Durlauf's work also included the effect of neighborhood distribution of incomes on the productivity of educational expenditures. Karla Hoff and Amartya Sen's study examined the way in which the value of a home is affected by expenditures of the neighbors. Karla Hoff & Anjit Sen, *Home-Ownership, Community Interactions and Segregation*, World Bank (2000).

47. See Mark Dynarski, Robert Schwab & Ernest Zampelli, *Local Characteristics and Public Production: The Case of Education*, 26 J. URBAN ECON. 250 (1989); Charles F. Manski, *Educational Choice (Vouchers) and Social Mobility*, 11 ECON. OF EDUC. REV. 351, 356 (1992).

48. Bowles and Gintis have argued that, in affecting the life-chances of students, well-financed schools do far more than to provide superior training in cognitive skills. Attending and completing school signals to the employer that the student has an appropriate discount rate for time—that she is oriented toward the future and will act so as to avoid termination and keep her job. Attendance also signals other traits—deference to authority, fear of failure, leadership and degree of trust. Finally, schools influence which cultural models children are exposed to. Particularly when cultural values vary from the traits of parents, schools can function to spread cultural traits that would not otherwise proliferate. See SAMUEL BOWLES & HERBERT GINTIS, *SCHOOLING IN CAPITALIST AMERICA REVISITED* (Basic Books 2001).

middle class, for reasons that are explored in the next section.⁴⁹ And attending a good school increases the likelihood that the graduate has potentially useful business connections. The right school means marketable skills, the right work ethic, the right social skills and the right connections. At least one author has argued that education has replaced family lineage as the new currency of status.⁵⁰

Several scholars have studied the dynamic relationship between public school finance and persistent residential segregation.⁵¹ According to research by economist Roland Benabou, the “neighborhood effects” of public school finance are so strong that even small differences in public school financing can sort neighborhoods by income and by race over time, even if the neighborhoods are initially mixed.⁵²

Benabou’s economic model starts with two neighborhoods that have an equal proportion of rich and poor families. If education spending in Neighborhood A becomes slightly higher than Neighborhood B, the land in A becomes more valuable, and so the price of housing in A rises. The wealthier families in B now are more likely to move to A to take advantage of the good schooling and appreciating property values. The mix of neighbors left behind in B, in turn, is now relatively poorer, and education spending likely will decrease. Another round of defections ensues, with the relatively wealthier families departing, until land in A becomes too expensive for anyone in B to purchase. Owing to this feedback loop, even minor differences in education spending can cause neighborhoods to stratify by income over time. Moreover, these forces can slow down or even reverse any income convergence between rich and poor.

So much for the theoretical model. What happens in real life, when neighborhoods do not begin equally mixed, but have been racially and economically segregated for a long time? In Benabou’s view, given the country’s lengthy history of racial segregation, racial disparities might now be just too great to overcome because of self-reinforcing feedback loops. Racial discrimination during Jim Crow and slavery allowed wealthier whites to “capture” the benefits of their racial monopoly, in two ways. First, whites enjoyed the benefit of buying into good neighborhoods at artificially lowered prices. Under the regulation of Jim Crow laws and informal social norms, blacks were not allowed to bid on land to which white families moved. This exclusion artificially decreased land prices for the benefit of

49. *See id.*

50. *See* DAVID BROOKS, *BOBOS IN PARADISE: THE NEW UPPER CLASS AND HOW THEY GOT THERE* (Simon & Schuster 2001).

51. *See* Dennis Epple and Richard Romano, *Competition Between Private and Public Schools, Vouchers, and Peer Group Effects*, 88 *AMER. ECON. REV.* 33 (1998); Rachel Fernandez and Robert Rogerson, *Income Distribution, Communities and the Quality of Public Education*, 111 *Q. J. ECON.* 135 (1996).

52. Roland Benabou, *Equity and Efficiency in Human Capital Investment: The Local Connection*, 63 *REV. OF ECON. STUDIES* 237, 238 (1996); *See also* Roland Benabou, *Human Capital, Inequality and Growth: A Local Perspective*, 38 *Eur. Econ. Rev.* 817 (1994).

whites, particularly in the suburbs, but also in urban white neighborhoods.⁵³

Second, now that non-whites are permitted to buy into any neighborhood without regard to race, those home buyers who move into white neighborhoods pay full value to buy in, unlike white residents, who were able to buy in at lowered prices. Moreover, even those whites who are buying into a new neighborhood for the first time will enjoy an advantage over non-whites. Namely, whites who grew up in all-white neighborhoods with better-funded schools have benefitted from a racial monopoly surplus. White families have enjoyed the higher income and wealth that accompany attending better-funded schools and the higher property values that accompany neighborhoods with better-funded schools.⁵⁴ When whites buy into a new neighborhood in order to trade up, they can draw on that monopoly surplus to pay the bill; blacks and Latinos cannot.

Benabou notes that this public school finance feedback loop works in only one temporal direction, as is often true with feedback loops. Namely, once neighborhoods have become stratified by race and class, dismantling the feedback loop becomes far more difficult to do without producing bad results, like the racial displacement that comes with gentrification. As Benabou remarks,

[S]tratification is likely to be much harder to undo once it has occurred than it is to stop [it] in its tracks early on. Due to the cumulative nature of the process, the amount of transfers required to induce the first few rich families to come back is considerably larger than what it would have taken to make them stay in the first place.⁵⁵

C. *Coordination Standards for Future Distributions*

Being the first group to populate a profession or an industry or a school does not just mean a material head start. It also means that the group can potentially control the standards for coordination and compatibility in the workplace or the classroom, in a way that favors the incumbents. Accordingly, the advantage of being the first-mover monopolist can reproduce itself indefinitely into the future.

53. Beyond the self-reinforcing advantage to whites that historical monopoly conferred, blacks also suffered accompanying disadvantage in their ability to pay for housing in segregated neighborhoods. According to historian Arnold Hirsch, blacks paid more to buy housing in segregated neighborhoods, largely because supply was restricted to a smaller geographic space. At least in the rental market, blacks paid 15 to 50 percent higher rent than whites paid for similar accommodations. See ARNOLD HIRSCH, *MAKING THE SECOND GHETTO* (1998).

54. See Benabou, *supra* note 52, at 247.

55. *Id.* at 257.

In the economics and antitrust literature, standard setting focuses on the question of who controls the standards that govern uniformity, coordination and compatibility. Much of a product's value derives from its compatibility with other components of a system. For example, the value of a microprocessor derives in large part from its "vertical" compatibility with an operating system, hardware (printer, keyboard, monitors) and software applications.⁵⁶ Likewise, the value of a compact disk or videocassette player comes from being able to play as wide a range of CDs or videotapes, from as many different sources as possible.

Often, competitors choose to offer "competing standards" rather than compete head-to-head within the same standards. In the VCR wars, Sony and JVC decided to offer two different formats—VHS and Beta. They might have chosen instead to make their video recorders compatible with each other, and to compete within the parameters of a common standard, much as Sony and Phillips did when they agreed on a standard for CD players.⁵⁷

Standards are primarily valuable because they facilitate communication and connection. In their work on standardized "boilerplate" contract terms, Marcel Kahan and Michael Klausner suggest that using a standardized term confers three types of benefits: (a) lawyers need less time to formulate a precise term and will make fewer errors; (b) lawyers are more certain about the meaning of the term because prior judicial opinions have provided background information; and (c) lawyers can communicate with other members of the relevant contractual community—lawyers, contracting parties, and judges—because the term facilitates a shared understanding about the parties' meaning and intent. Speaking the standard language with other parties is one of the most important functions of a contract.⁵⁸

Compatible products and products that communicate well with other products or users are more valuable on the market. Thus, a firm that acts anti-competitively in order to control the standard can have an extremely profitable market position—sometimes referred to as an "architectural franchise"—because the firm can monopolize compatibility profits.⁵⁹ This is particularly true when some barrier (like patent law or a steep learning curve) prevents competitors from making use of the standard.

Accordingly, antitrust law pays attention to standards because they are potentially susceptible to manipulation and can thereby reduce competition. If a firm manipulates the market to control the standard, consumers

56. Mark Lemley, *Antitrust and the Internet Standardization Problem*, 28 CONN. L. REV. 1041, 1048 (1996).

57. Stanley M. Besen & Joseph Farrell, *Choosing How to Compete: Strategies and Tactics in Standardization*, 8 J. ECON. PERSPECTIVES 117, 121, 126 (1994).

58. See Marcel Kahan & Michael Klausner, *Standardization and Innovation in Corporate Contracting*, 83 VA. L. REV. 713 (1997). See also Marcel Kahan and Michael Klausner, *Path Dependence in Corporate Contracting: Increasing Returns, Herd Behavior and Cognitive Biases*, 74 WASH. U. L.Q. 347 (1996).

59. See Besen and Farrell, *supra* note 57, at 119.

may lose variety. For example, in an industry where IBM-compatible machines are the standard, Apple computers offer a number of capabilities that are not available on IBM-compatible machines. IBM compatibility is not a formal standard—it is rather a “de facto” standard that allows for some competition by Apple. Nevertheless, many a person has succumbed to the demands of an IBM-compatible world by replacing an Apple computer with a PC.

Indeed, Mac users at the Johnson Space Center in Houston had to organize an agency-wide campaign to delay the switch from Macs to PCs. Johnson administrators had authorized the switch on grounds that Johnson’s computers needed to be compatible with the rest of NASA and the country. The agency had adopted a Windows standard in 1995, much to the chagrin of those rocket scientists in computer-aided design (CAD) and engineering, who argued that the Mac was much more suited to tasks in their fields. Workers organized and complained to Johnson administrators about the impending agency-wide change. After the IG’s intervention, the space center put a hold on its plans to make the switch.⁶⁰

D. Coordination and Compatibility in the Workplace

What do standards and the Mac vs. PC wars have to do with racial inequality? We can analogize standards for interoperability in the high-tech area to standards for compatibility in the workplace. In both settings, the ability to work together and communicate is key. Just as a monopolist can set the “standard language” for compatibility in high-tech markets, so too can racial cartels set the standard for coordination and compatibility in areas like employment. Likewise, just as standardizing can produce a self-reinforcing first-mover advantage in personal computers, so too can standardizing the workplace reinforce an early Jim Crow first-mover advantage for whites.

In the workplace, compatibility has much to do with demographics. Demographic diversity affects the compatibility of members on a work team and their productivity levels in a number of ways. First, diversity affects the quality of workplace communication. Research by organizational theorists suggests that corporate management teams made up of people who are demographically and culturally similar are likely to develop a shared language that reflects similar experiences, backgrounds, beliefs and values. This shared standard language—and the shared view of the world that language reflects—improves communication among team members, both in terms of how often they communicate and how effectively.⁶¹

60. See *Big Mac Attack: Apple Users at NASA Say Switch to PCs Doesn't Compute*, HOUSTON BUS. J. Aug. 9, 1996.

61. Margarethe F. Wiersema & Karen A. Bantel, *Top Management Team Demography and Corporate Strategic Change*, 35 ACAD. MANAGEMENT J. 91, 95 (1992). This study looked at age, organizational tenure, team tenure and education. Socio-linguists sometimes refer to this shared language as “restricted code.” to describe the “shortcuts” people take in communicating with others who collectively share common background knowledge, assumptions, mental models, experiences and views of the world. See BASIL BERNSTEIN, *CLASS, CODES AND CONTROL* (Schocken Books 1975).

Conversely, demographically mixed groups communicate less often and less effectively.⁶²

Second, diversity affects the level of interpersonal relationship conflict in the workplace. Mixed work teams experience more conflict around issues not directly related to the task at hand, but having to do with interpersonal matters. Demographic differences in social categories—race, gender, age—can generate animosity, tension and annoyance (sometimes overtly race-related, sometimes not) among members in a mixed group. In turn, animosity, tension and annoyance inhibits team performance because group members are less able to assess information from others, are more emotional and are less receptive to ideas of others. Likewise, increased conflict funnels time and energy away from the task and toward resolving the conflict.⁶³

Devon Carbado and Mitu Gulati have explored the legal and organizational implications for these arguments about compatibility. In part, they note that because of the pressure to standardize, firms tend to choose applicants of color whose experiences, perspectives and approaches most closely resemble those of whites. Of course, they note that blacks, Asians and Latinos have had far less success in assimilating to white norms, given the larger differences in family history and experiences that exist for these groups than for white ethnics. Carbado and Gulati argue that the law tends (improperly) to use “assimilated” minorities as the baseline for measuring discrimination.⁶⁴

At the same time, social category diversity can sometimes improve a team’s performance, particularly on tasks that require innovation and creativity. A number of studies have found that diversity improves performance on tasks that require searching through a large number of alternatives or problem solving creatively.⁶⁵ Diversity promotes divergent thinking, by bringing other perspectives, viewpoints and experiences to the table, which improves creativity and problem-solving. Diverse perspectives and experiences provide a wider range of “searchable space” in which to look for answers to problems.⁶⁶

So what is the bottom line with regard to race? Does racial diversity diminish performance and productivity or not? Recent research has produced mixed results. Much of the research suggests that the effect of race in the workplace depends on the kind of tasks that work teams are asked to perform. For routine, simple “exploitation” tasks, in which teams are asked to exploit an existing set of skills as efficiently as possible, diversity

62. Harry Triandis, *Cognitive Similarity and Interpersonal Communication in Industry*, 43 J. APPLIED PSYCH. 321 (1959).

63. Karen A. Jehn, *A Multimethod Examination of the Benefits and Detriments of Intragroup Conflict*, 40 ADMIN. SCIENCE Q. 256, 259 (1995).

64. Devon Carbado & Mitu Gulati, *The Law and Economics of Critical Race Theory*, 112 YALE L.J. 757 (2003).

65. See *id.* at 261.

66. SCOTT PAGE, *THE LOGIC OF DIVERSITY* (unpublished manuscript, on file with author).

can reduce performance.⁶⁷ Because single race work teams can share a common set of experiences, and usually suffer from fewer interpersonal conflicts, racially homogenous work teams may be more productive than racially mixed teams.

In contrast, for more complex “exploration” tasks, in which teams are asked to explore potential strategies for organizational change or assess long-term organizational needs, studies indicate that racial diversity can actually improve performance.⁶⁸ So, for example, in setting the future direction of a very innovative high-technology company, racially diverse work teams may be more creative.

Importantly, however, diverse creativity comes at a cost. Employers must take into account the risk and the cost of diminished performance.⁶⁹ Likewise, the employer often must pay to manage the potential interpersonal conflict that comes with racial diversity.⁷⁰ Without effective management, conflict may diminish the performance of a strategic work team even as diversity improves performance in other ways. To be sure, this last cost may well be acceptable for those teams that are engaged in “exploration” tasks, because these diverse teams will produce more if they are managed effectively. In contrast, costs associated with diversity may be less acceptable for companies that specialize in more exploitation tasks—e.g., an industrial factory that does not need to update its technology frequently.

Information problems about potential diversity benefits may hamper a firms’ ability to forecast in the long run. Research shows that all organizations pay less attention to the potential longer-term benefits of diversity and more to short-term. Benefits from creativity and innovation are more uncertain and are only realized over time. As a result, organizations characteristically focus more on the immediate costs of diversity as opposed to

67. For the research on the productivity of heterogenous work teams, see Karen A. Jehn, Clint Chadwick and Sherry M. B. Thatcher, *To Agree or Not to Agree: The Effects of Value Congruence, Individual Demographic Dissimilarity and Group Conflict on Workgroup Outcomes*, 8(4) INT’L J. CONFLICT MAN. 287 (1997). See also Valerie I. Sessa, *Why Team Demographics Have an Influence on Team Effectiveness: Conflict as a Mediating Variable* (paper presented at the annual meeting of the Academy of Management, Atlanta, GA (1993)). James March draws the distinction between exploration and exploitation tasks. Exploration includes search, experimentation, variation, innovation, discovery and risk taking. Exploitation involves refinement, implementation, execution, production, efficiency. James G. March, *Exploration and Exploitation in Organizational Learning*, 2 ORGANIZATION SCIENCE 92 (1991).

68. Lisa H. Pelled, Kathleen M. Eisenhart, & Katherine R. Xin, *Exploring the Black Box: An Analysis of Workgroup Diversity, Conflict and Performance*, 44 ADMIN. SCI. Q. 1 (1999) (looking at race, age and tenure).

69. Richard Epstein makes the point that heterogeneous groups increase costs because their preferences diverge, and it will cost the employer to develop a set of collective decision-making rules—governance costs—to manage divergent preferences. Moreover, the employer will bear the cost of managing the dissension that remains after a decision is made, particular for winner-take-all decisions. RICHARD EPSTEIN, *FORBIDDEN GROUNDS: THE CASE AGAINST EMPLOYMENT DISCRIMINATION LAWS 61-69* (Harvard Univ. Press 1992). In Epstein’s words, “[i]t is harder to do business as social distance between persons increases.” *Id.* at 66.

70. Charles A. O’Reilly, Katherine Y. Williams & Sigal Barsade, *Group Demography and Innovation: Does Diversity Help?* in RESEARCH IN THE MANAGEMENT OF GROUPS AND TEAMS (Elizabeth Mannix & Margaret Neale eds. 1997).

longer-term benefits.⁷¹ Thus, firms might undervalue the benefits of diversity.

In sum, because of the costs associated with diversity, standardizing reproduces whites' early monopoly advantage of being the first-mover. Chapter 2 discusses in great detail the conduct of white labor unions, professional associations and guilds to specifically exclude blacks and Latinos from employment, especially in professional and high-wage jobs. These workplaces filled up exclusively with white employees and workers, which makes it more likely that in the future, employers will hire white workers. Standardizing may favor those racially defined first-movers, even as it produces certain efficiencies in the workplace. The following chapters will discuss the dilemmas that mostly white firms face when they decide whether to make the switch to a more diverse workforce.

E. Network Effects

A fourth type of feedback loop reproduces white advantage: network connections. "Network effects" are the benefits and disadvantages that flow from network connections. In network markets, the value of a product can flow from the number of users connected in a network. For example, the value of a telephone is largely derived from the number of other people whom one can dial up. Similarly, but perhaps less intuitively, the value of a VCR comes in part from the number of "network suppliers" of videotape—your favorite rental store, the library, and your network of family and friends.

Some economists have argued that network effects facilitate a natural monopoly for networked products, because the first firm to market such a product can often tip the market in their favor before competitors really have an opportunity to attract users.⁷² Others have noted that, for the illegal monopoly, network effects can reproduce inequality, even when the monopolist has stopped acting illegally. The Department of Justice's case against Microsoft was based on a version of the network effects argument. Thus, legal scholars in the field of high-tech antitrust have paid a fair amount of attention recently to network effects.⁷³

In social networks, as in telephones, the value of a professional connection often derives from the resources that the connection can make available. Network connections can hook a person up to several different kinds of resources. First, "who they know" is most often important because of what they have (and can make available). Network connections

71. See JAMES MARCH, *supra* note 68, at 73.

72. See ARTHUR, *supra* note 14.

73. See Clayton P. Gillette, *Lock-In Effects in Law and Norms*, 78 B.U. L. REV. 813 (1998) (discussing network effects in norm dynamics). A number of authors have been less convinced of the operation of network effects. See LIEBOWITZ & MARGOLIS, *supra* note 16; Stanley Liebowitz and Steven Margolis, *Network Externality: An Uncommon Tragedy*, 8 J. ECON. PERSPECTIVES 133 (1994); Mark A. Lemley and David McGowan, *Legal Implications of Network Economic Effects*, 86 CAL. L. REV. 479 (1998).

can make available money or other forms of material resources.⁷⁴ Second, network connections are also important because of “what they know”—network connections can disseminate information. For example, network ties can pass along information about job openings, or pass on tips about the important social symbols and rules that govern a particular cultural setting (“cultural capital”). A network contact can advise a new worker about the power brokers on the plant floor, or about the custom of making decisions behind closed doors. Indeed, recent research suggests that gossip among members of a network can pass along valuable information about organizational norms.⁷⁵

Third, network connections can influence people by shaping their preferences or decisions, sometimes more coercively than others. For example, employers can be talked into hiring someone by the person’s network referees, who go to bat for the candidate. Likewise, employees can be pressured by their connections into conforming to company policy.⁷⁶ Finally, network connections can provide a person with a sense of well-being and esteem, prompting some researchers to argue that social networks form for this very reason.⁷⁷

Social and institutional networks distribute group capital not only across space but also across time. Networks can function to pass along wealth, opportunities, information and influence to successive generations. The following section focuses in particular on the racial divide in social networks and employment.

F. Job Search Networks

Informal referral networks play a key role in distributing jobs, particularly high-wage and professional jobs. Sociologists like Mark Granovetter have demonstrated that employers fill well over half of all jobs via personal referrals, although the number is slightly lower for black job candidates than for white.⁷⁸

What makes job networks effective? Why do people participate in these networks, particularly when they have nothing immediate to gain? Job referral networks distribute a number of benefits to network members.

74. Alejandro Portes, *Social Capital: Its Origins and Applications in Modern Sociology*, 24 ANN. REV. SOC. 1, 4 (1998).

75. David S. Wilson, *Gossip and Other Aspects of Language as Group-level Adaptations*, in COGNITION AND EVOLUTION (Charles Heyes and Lawrence Huber eds. 2000).

76. Sociologist Pierre Bourdieu defines social capital as the pool of actual or potential resources that are linked to membership in a network of acquaintance or recognition. Pierre Bourdieu, *The Forms of Capital*, in HANDBOOK OF THEORY AND RESEARCH FOR THE SOCIOLOGY OF EDUCATION 248, (JG Richardson ed. 1985).

77. Nan Lin, *Building A Network Theory of Social Capital*, 22 CONNECTIONS 28, 31 (1999).

78. Mark S. Granovetter, *The Strength of Weak Ties*, 78 AM. J. SOC. 1360, 2371 (1973) (reporting in a study of professional, managerial and technical workers that over 56 percent of employees found their jobs through references from social contacts). See also MARK S. GRANOVETTER, GETTING A JOB: A STUDY OF CONTACTS AND CAREERS 11 (1995). Truman Bewley has prepared a survey of research on the percentage of jobs filled via network contacts. TRUMAN F. BEWLEY, WHY WAGES DON'T FALL DURING A RECESSION (Harvard Univ. Press 1999).

Well-connected job candidates can search through a larger network space for potential job openings, to increase the likelihood of employment. Employers use network referrals because the referees will screen in advance prospective candidates for skills, diligence, efficiency, employability, and compatibility with current workers.⁷⁹ Referees participate because referring a new employee stores up goodwill and political capital with both the candidate and the employer, to be retrieved at a later time.⁸⁰ Because the referee, the worker and the employer will gain benefits, all have an incentive to use the network.

Not surprisingly, race rears its head in network connections. Comparative studies show significant racial differences in the types of jobs that people get through their job referral networks. According to work by Diedre Royster and Mercer Sullivan, white men entering the workforce get lots of help from older men in their social networks—shop teachers, fathers, neighbors and friends of the family frequently help on the job search, particularly if the candidate is looking for entry level work or an apprenticeship in high-wage trades jobs that are unionized. Blacks and Latinos, by comparison, have far fewer older men in their social networks who are able or willing to serve as a network referral for steady, high-wage employment. Indeed, when compared to whites and Latinos, blacks have the fewest network connections to industrial and trade occupations.⁸¹ Thus, the type of jobs embedded in networks differ significantly by race.

Research reveals a number of other important racial differences in social networks. First, blacks and whites have referral networks that differ in density—the number of connections that each person in the network possesses. Density is very important in making a network effective. Referral networks will cease to “hang together” if the number of connections to people with jobs drops below a critical density. Above this threshold, referral networks have enough links between people to function properly. Below the critical number, the network literally disintegrates and falls apart.

Fragmented networks cause huge problems for racial groups. Without effective networks, whole communities can become so isolated from high-wage jobs that members are perpetually unemployed.⁸² Work by Kenneth Arrow and Ron Borzekowski indicates that, because of networks’ critical threshold, even very small differences in the number of ties can induce isolation and substantial income inequality across racial lines.⁸³

79. See Roger Waldinger, *Network, Bureaucracy, Exclusion*, in *HOW THE OTHER HALF WORKS: IMMIGRATION AND THE SOCIAL ORGANIZATION OF LABOR* (Univ. of Cal. Press 2003).

80. See James S. Coleman, *Social Capital in the Creation of Human Capital*, 94 *AMER. J. SOC.* 95, 108 (1988).

81. See ROYSTER, *supra* note 10; MERCER L. SULLIVAN, *GETTING PAID: YOUTH CRIME AND WORK IN THE INNER CITY* (Cornell Univ. Press 1989).

82. Lisa Finneran & Morgan Kelly, *Social Networks and Inequality*, 53 *J. URB. ECON.* 282 (2003).

83. Kenneth J. Arrow & Ron Borzekowski, *Limited Network Connections and the Distribution of Wages*, Staff Working Paper prepared for U.S. Federal Reserve Finance and Economics Discussion Group (August, 2004); See also James Montgomery, *Social Networks and Labor-Market Outcomes: Toward An Economic Analysis*, 81 *AMER. ECON. REV.* 1408 (1991).

Second, racial differences affect the strength of the network connection. Most scholars agree that the strength of network ties affects the network's function, and that race is related to the strength of network connections. Interestingly, they do not agree on whether strong ties or weak ties are more effective. One school of thought, represented by the work of sociologist Nan Lin, argues that, at least in the case of more mature workers, strong ties increase a person's chances of connecting to people who have the authority to influence hiring decisions.⁸⁴ To ask someone in power to intervene in a hiring decision, the job candidate must have a fairly strong relationship to the decision maker, or must know someone who knows the decision maker quite well.

Lin argues that blacks and Latinos may not have social networks with sufficiently strong ties to persuade decision makers to act on the candidate's behalf. Royster's work confirms this notion. In her study, although white and black male students took classes from the same high school shop teachers, the white shop teachers were far more likely to ask white students to do work on the side for them, or to put them in touch with the union foreman or some other person in high authority when job seeking.

An alternative school of thought, made famous by the work of sociologist Mark Granovetter, argues that weak ties actually work better because weak ties will pass along information that differs from what the candidate and her close circle already have.⁸⁵ Because weak ties are usually people who are not connected to each other, a network of weak ties may provide a bridge across the disconnected segments of a network, called "structural holes."⁸⁶ Bridging the structural holes gives a candidate a much wider searchable space for job prospects.

Empirical research on racial differences seems to indicate that blacks and Latinos may be less successful on the job market because their networks are smaller and their ties stronger. Without a large network of weak ties, these groups cannot search as productively across structural holes.⁸⁷ Whether because their network ties are too weak or too strong, networks operate less effectively for people of color than they do for whites.

Why is it that social networks do not become integrated? Even in the absence of overt racism, networks remain segregated because like tends to attract like (social psychologists call it "homophily").⁸⁸ In addition, social contacts take place in the context of social institutions –neighborhoods,

84. Nan Lin, Walter M. Ensel, & John C. Vaughn, *Social Resources and Strength of Ties: Structural Factors in Occupational Status Attainment*, 46 AMER. SOC. REV. 393 (1981).

85. See GRANOVETTER, *supra* note 78, at 52.

86. RONALD S. BURT, STRUCTURAL HOLES: THE SOCIAL STRUCTURE OF COMPETITION (Harvard Univ. Press 1995). Structural holes can create a competitive advantage for a person whose relationships bridge the holes or gaps. Holes provide this individual an opportunity to control the flow of information between the disconnected parts of the network. NAN LIN, SOCIAL CAPITAL: A THEORY OF SOCIAL STRUCTURE AND ACTION 70-71 (Aldine Transaction 2001).

87. James D. Montgomery, *Social Networks and Labor-Market Outcomes: Toward an Economic Analysis*, 81 AM. ECON. REV. 1408 (1991).

88. See LIN, *supra* note 86, at 66.

schools, workplaces—that tend to be segregated for reasons already discussed. It is hard to say whether the architecture of social networks would look different if history had been different. Resources attached to those networks might well be much more equally distributed if they had not been so stratified early on.

All four of these institutional feedback loops contribute to persistent racial inequality. In each loop, whites have parlayed their early monopoly advantage into continuing advantage. More generally, feedback loops help to explain why whites' material well-being consistently ranks above the well-being for non-white groups, and blacks and Latinos in particular. Previous chapters have explained that these groups started out with dramatic initial differences in their levels of wealth. Using the compound interest bank account analogy, whites and non-whites began with very different initial deposits. Even if we assumed that the compound interest rate for both groups was the same, the feedback loops described above reproduce early advantage into continuing advantage because whites and non-whites began with very different levels of initial assets, owing to discrimination.

But some evidence indicates that the compound interest rates themselves might differ significantly between groups. Research on class mobility indicates that a mobility gap exists between blacks and whites. In a nationally representative study, economist Tom Hertz discovered big mobility differences between blacks and whites at all levels of parental income, and particularly large differences in the wealthiest brackets. For example, Hertz found that 30 percent of white children born to the top tenth of the country's wealthiest people remain in the top ten percent, compared to just 4 percent of black children.

At the other end of the spectrum, only 17 percent of white children born to the poorest ten percent of the population stay in that bottom bracket, compared to 42 percent for black children. Hertz documents that ten times as many black children remain in the bottom decile as at the top. In contrast, twice as many white children remain at the top decile as remain at the bottom.⁸⁹ This research helps to explain why racial poverty persists even though average black and white incomes have converged slightly in past years. More broadly, the research indicates that differences in the feedback loops themselves, and not just the initial historical asset differences between groups, contribute to persistent inequality.

III. EMERGENCE

Contemporary anti-discrimination law defines racism as the choice made by an individual person to intentionally exclude someone on the basis of an irrational stereotype. But the institutional feedback loop and the concept of "emergence" demonstrates how institutional processes can

89. Tom Mertz, *Rags, Riches and Race: The Intergenerational Economic Mobility of Black and White Families in the United States*, in *UNEQUAL CHANCES: FAMILY BACKGROUND AND ECONOMIC SUCCESS* (S. Bowles, H. Gintis & M. Osborne eds. forthcoming).

shape social patterns separate and apart from individual behavior. Racial inequality can “emerge” when people who are following race-neutral rules interact with each other.

The concept of emergence is drawn from complex systems theory, to explain how complex and unpredictable social patterns can emerge from individual agents who follow very simple rules. For example, in an ant colony, individual ants’ behavior is governed by very simple rules like “follow the pheromone trail of the ant in front of you.” The individual investor follows the simple rule “buy low, sell high.”

In comparison, the behavior of the ant colony and the stock market is far more complex. For example, ant colonies will relocate after a flood and move to higher ground. Contrary to popular lore, the colony’s good sense to move after a natural disaster comes not from some direction to evacuate by the ant queen, but rather from the complex interaction of ants who are just following very simple rules of behavior. The stock market also demonstrates complex behavior—bubbles, crashes and free-falls on occasion—that cannot be predicted from or reduced to individual choices.

Likewise, racial inequality can emerge from group behavior even when individuals are following race-neutral rules of behavior. Our discussion of feedback loops helps to explain how that happens. At the level of individuals, people are following simple, race-neutral rules—like “move to a new neighborhood if your neighbors are wealthier and it has a well-funded school “ or “hire new employees through people you already know.” At the level of the collective, however, given the country’s history, they are interacting in ways that reinforce historical racial inequality. Given historical patterns and arrangements, the racial inequality can emerge from the interaction of actors without bias.

IV. AN AGENT-BASED MODEL

In a forthcoming project, Derek Robinson and I have developed an agent-based model to demonstrate the self-reinforcing nature of institutional feedback loops. Our model shows how neighborhood effects can work to reproduce residential segregation.⁹⁰ In this model, black and white families (or “households”) engage in two primary activities during each “generation” or iteration. First, households acquire wealth. In particular, they accumulate wealth from two sources. Initially, a portion of each household’s wealth comes from their “inheritance” from the previous generation. In addition, the remainder comes from added social capital that

90. See Daria Roithmayr & Derek Robinson, *An Agent Based Model of Residential Segregation and Fair Housing Law* (draft on file with author). Agent based modeling is a method used by complex systems theorists to represent the interactions of individual agents in a complex system according to simple rules of conduct. The computer simulation permits the modeler to set initial conditions and then to run the model to simulate dynamic evolution. See Robert Axelrod, *Advancing the Art of Simulation in the Social Sciences*, in *SIMULATING SOCIAL PHENOMENA* (Rosario Conte, Rainer Hegselmann & Pietro Terna eds. 1997).

they acquire from their neighbors.⁹¹ (This social capital is meant to reflect a wide range of neighborhood capital, including the value of public schools and of access to job referral networks). Second, households move to more attractive neighborhoods. Families are allowed to move under two conditions: first, if a move will help a household “trade up”—i.e., if the new neighbors are on the average wealthier than the old neighbors,⁹² and second, if the household is wealthy enough to buy into the new neighborhood.⁹³

As is detailed in the Appendix to this chapter, the simulation takes place in two periods of play. During the first period, the period of segregation, black households are not permitted to move into white neighborhoods. At the beginning of this period, white households are assigned more initial wealth than black families, to reflect the dramatic differences between black and white families after the end of slavery and Jim Crow.⁹⁴ During the second period, the period of legal integration, all households can move into any eligible vacancy, subject only to financial constraints and not to racial restrictions. Importantly, for both periods of play, households have no preferences about the race of their neighbors.

Figure 1 below demonstrates the location of black and white households at the beginning of the first period of simulation. Black households (represented in blue) represent 20 percent of all households. Households are randomly located in each racial neighborhood. Each area contains an equal mix of rich and poor households along wealth curves, but the median

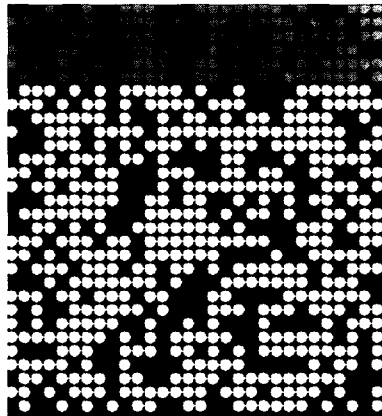


FIGURE 1: INITIAL HOUSEHOLD LOCATIONS
AT THE BEGINNING OF SIMULATION

91. Asset accumulation for each family increases each generation by 5% of the previous generation's assets, and by 3% of the average assets from neighbors. *See* Appendix A-1, *infra*.

92. Whether the neighborhood is sufficiently attractive is determined by assessing whether the average neighbor's assets are at least fifteen per cent greater than the moving family's assets. *See id.*

93. Whether a family can afford to move into the neighborhood is determined by whether the family's assets are greater than or equal to the average of neighbor assets. *See id.*

94. Black families are assigned 60% fewer initial assets than white families, to reflect disparities in wealth that existed at the end of Reconstruction. *See id.*

wealth for white households is significantly larger than for black households.

During the first period of play, households accumulate wealth and move around. Segregation of neighborhoods affects the rate of wealth accumulation for white and black households. Because white households have more initial wealth relative to blacks, white households will pass down more wealth to their children and grandchildren. As importantly, because blacks are not permitted to move into wealthier white neighborhoods, and because their neighbors are poorer, black households generate less social capital from their neighborhoods than do wealthier white households.

Figure 2 shows the household locations of blacks and whites after the first period of play, at the end of legal segregation. This frame indicates that some poorer white households have moved into black neighborhoods, but owing to the rules, no black households have been permitted to move into white neighborhoods. Wealth differences between the races become more pronounced.

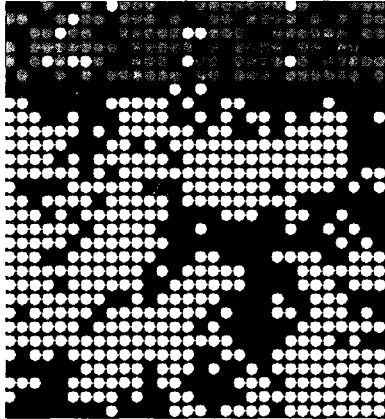


FIGURE 2: HOUSEHOLD LOCATIONS AFTER INITIAL SEGREGATION PERIOD

During the second period, that of legal integration, wealth accumulation and movement continue. Blacks are now permitted to move close to whites, subject to their ability to buy a house in the neighborhood.

Figure 3 below shows the household locations after this subsequent period of legal integration.

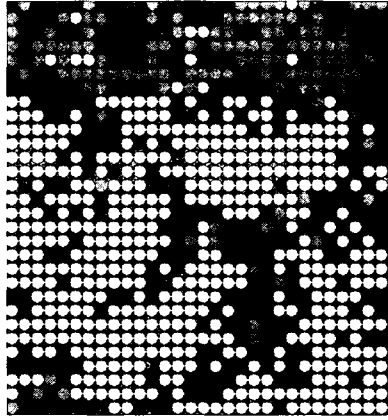


FIGURE 3: HOUSEHOLD LOCATIONS AFTER LEGAL INTEGRATION PERIOD

Figure 3 demonstrates that, although a few more white households have moved into black neighborhoods, and a few black households have moved to the outer edges of white neighborhood clusters, most if not all residents are still living in relatively segregated neighborhoods, despite the lifting of legal segregation rules.

Multiple runs of this simulation demonstrate that in twenty-four out of twenty-five runs, households remain largely segregated by both race and wealth. Black households are not able to move into neighborhoods with white families in any significant number, because they are unable to afford the relatively more expensive housing prices. In one out of twenty-five runs, owing to random luck and the optimal distributions of wealth and the dynamics, black families are able to integrate well into the white neighborhood.

The agent-based model provides a useful way to visualize the self-reinforcing nature of institutional feedback loops. More specifically, with regard to neighborhood effects, the model demonstrates how *de jure* segregation on the basis of race can become locked in place through an emergent evolutionary process, even in the absence of intentional discrimination.⁹⁵

V. OTHER GROUPS, OTHER HISTORIES: HISTORY AND FEEDBACK LOOPS

Somewhere in the description of the lock-in model, someone inevitably raises the question of other racial groups. Why weren't Asians and Jews also affected by racial cartels and by self-reinforcing institutional feedback loops? How were they able to escape the ghettos?

95. The Appendix contains relevant programming information and initial parameter settings for the model.

Chapter Two makes the important point that historical differences in the kind and degree of anti-competitive activity may explain the differences in contemporary well-being among groups. As that chapter makes clear, segregation for blacks and Latinos has always been significantly more severe than for other groups, and in particular for Jews and many Asian groups (Chinese, Japanese and Korean, but not Laotians, Hmong, Cambodians and Thai, for whom segregation is dramatic).

Beyond differences in anti-competitive exclusion, historical differences in the nature and duration of institutional feedback loops may also explain relative degrees of success. For example, although so-called “ethnic ghettos” existed for other racial groups besides blacks, they were never homogeneous. Even in ghettos that were publicly identified with a particular group, the enclave usually contained a wide range of nationalities, and a wide range of wealth and capital. In addition, a significant number of members of those groups lived outside the ghetto, in contrast to blacks at the turn of the century, most of whom lived in a deeply segregated neighborhood.

Likewise, the duration of the self-reinforcing feedback loop has differed significantly among groups. For example, ethnic enclaves proved fleeting, in comparison with the black ghetto. Segregation fell significantly for European immigrants after 1910 for a number of reasons, much of which had to do with a formation of white ethnic identity in reaction to the increasing in-migration of blacks.⁹⁶ In contrast, segregation for blacks and Latinos persisted right up until Congress enacted fair housing laws, and persist even today.

Finally, historical differences in initial levels of wealth for immigrants (for example, high levels of human capital and wealth for Jews, Japanese, Korean, and some waves of Chinese immigrants) may also explain those differences.⁹⁷ Because self-reinforcing processes reinforce the magnitude of even small events, these historical differences in initial wealth and in the nature and duration of feedback loops may well explain the significant differences among racial groups that currently exist.

VI. OUT OF THE LOOP: THE NATURE OF SELF-REINFORCING INEQUALITY

The simulation illustrated above shows graphically how patterns of race and class inequality can be produced by the dynamics of a complex system. The locked-in patterns visible in Figure 3 in particular show that racial inequality can persist even after white racial cartels have stopped all intentional discriminatory behavior.

96. See DOUGLAS MASSEY & NANCY A. DENTON, *AMERICAN APARTHEID: SEGREGATION AND THE MAKING OF THE UNDERCLASS* 3233 (1993).

97. See, e.g., Deborah Malamud, *The Jew Taboo: Jewish Difference and the Affirmative Action Debate*, 59 OHIO ST. L.J. 915 (1989) (arguing that Eastern European Jewish immigrants came with a set of labor skills in the garment industry that matched to particular service needs in the U.S. economy, and that Jews were able to find work in the civil service sector, an area of employment not open to blacks).

As the product of complex systems, persistent monopolies in both race relations and the market share three very important characteristics. First, both are path dependent. Microsoft's early illegal conduct explained its later advantage in the operating systems market. Likewise, early historical events like segregation and slavery have played a central "evolutionary" role in explaining why blacks and Latinos continue to lag behind whites on almost every measure of economic well-being. Given how massive the events of slavery and Jim Crow were—more like a fire or flood than a small random event—one might argue whether the phenomenon is really one of path dependence. At the same time, path-dependence is a concept quite useful in explaining how history has forever changed the path of contemporary race relations.

Second, as the next chapter will discuss in more detail, just as Microsoft's monopoly in operating systems may have become locked in, racial inequality may now be locked in place. Most available evidence suggests that, forty years after the passage of civil rights legislation, racial disparities have diminished very little over time in key areas like housing, wealth, education and employment.⁹⁸ The concept of self-reinforcing feedback loops helps to explain the persistent racial gaps in material well-being.

Third, just as self-reinforcing market monopolies can be potentially inefficient, so too can persistent racial inequality create social arrangements that are potentially inefficient for all. Earlier, this chapter referred to evidence that diversity actually improves performance when work teams are asked to solve problems or to innovate. Political scientist Scott Page has done some work comparing the problem solving efficiency of two groups: one made up of those agents who performed best when asked to solve the problem in isolation, and the other a random group of problem solvers.⁹⁹ Contrary to intuition, Page's random group of agents performed consistently better in problem-solving than the group of the best agents.

98. Recent research indicates that, contrary to popular perception, racial gaps are quite persistent and robust. See WILLIAM A. DARITY & SAMUEL L. MYERS, *PERSISTENT DISPARITY: RACE AND ECONOMIC INEQUALITY SINCE 1945* (1998). For example, a recent study suggests that the diminution of the racial gap in earnings is illusory, and wages between blacks and whites are not converging. This paper argues that earlier literature is flawed because it has excluded non-earners from the calculus. See Amitabh Chandra, *Is The Convergence of the Racial Wage Gap Illusory?* 1-5, 21-36 (Nat'l Bureau of Econ. Research, NBER Working Paper No. 9476, 2003). See also DARITY & MYERS, *supra*, at 4372. Likewise, recent groundbreaking research confirms a stable and substantial gap in education test scores, and argues that this gap is almost wholly attributable to the quality of schools. See Roland Fryer & Steven D. Levitt, *Understanding the Black-White Test Score Gap In the First Two Years of School*, (Nat'l Bureau of Econ. Research, NBER Working Paper No. 8975, 2002). To be sure, controversy exists over the question of permanence. Some studies indicate that racial gaps are closing, albeit slowly. See e.g., EDWARD WOLFF, *RACIAL WEALTH DISPARITIES: IS THE GAP CLOSING?* 5 (Levy Econ. Inst., Public Policy Brief No. 66, 2000) (estimating that it will take another 72 years to close the wealth gap at current rates); *THE BLACK-WHITE TEST SCORE GAP* 6 (Christopher Jencks & Meredith Phillips eds., 1998) (earnings gap and education gap are narrowing slowly). Even in this literature, however, scholars acknowledge that some aspects of the gap are quite persistent. See *id.* at 154, 167 (documenting that blacks continue to be grossly underrepresented in the upper tails of distribution, and gaps in social science achievement are not narrowing at all). In addition, this research confirms that much of contemporary disparity is explained by cumulative disadvantage. See Wolff, *supra*, at 5.

99. SCOTT PAGE, *supra* note 67.

Page's work suggests that collective difference and not "individual merit" offers more in terms of creativity and innovation, particularly as the global economy moves to more innovative enterprises.

What can government do to dismantle the lock-in process? As subsequent chapters will discuss in far more detail, government must modify structural feedback loops in some way to reduce their force, or completely dismantle them. For example, in public school finance, government can intervene to centralize funding away, and to decouple the loop between wealth and geography.

Likewise, governments can also design a "no exit" strategy to reduce white flight based on school funding differences. Political subdivisions like the city of Portland have moved to ensure that all school districts in a regional area desegregated by race and wealth, so that no school district offers a wealthier and whiter option to which families can flee.

Alternatively, the institutional feedback loop can be used in reverse to reinforce positive change. Moving a region's poorest families into the wealthiest neighborhoods can capitalize on the self-reinforcing effect of neighborhood benefits. A number of regions have moved to require that affordable housing be located in the wealthiest neighborhoods possible, and to require that affordable housing "crossfertilize" a mix of income and race among neighborhoods.¹⁰⁰

Relatedly, the idea of critical threshold suggests that in some circumstances, government interventions must be sufficiently big—far bigger than one would expect—to reverse cumulative advantage and disadvantage. For example, studies suggest that to significantly reduce the performance gap between poor and non-poor students, school districts should give poor students two to two-and-a-half times the funding for non-poor students, and should use the money to fund improvements in teacher quality and reductions in class size.¹⁰¹ Sometimes one must add a lot of heat before water will boil. Likewise, sometimes, government must bring significant resources to bear to reverse the spiral of disadvantage. On the other hand, if a complex system is operating just under some critical threshold, government may need to add only a little heat to make the water boil and produce significant change.

VII. REFRAMING INEQUALITY: FROM INDIVIDUAL TO INSTITUTIONAL

The story of the institutional feedback loop does not answer many of the important questions about persistent racial disparity. Is racial inequality merely the story about who got there first? How far back should one go to look at early anti-competitive conduct? Weren't the key historical events those that came much earlier - perhaps as Jared Diamond suggests,

100. Myron Orfield, [Vanderbilt Article, new draft]. On file with the author.

101. Kevin Carey, *Education Funding and Low-Income Children: A Review of Current Research*, Center on Budget and Policy Priorities, (November 2002).

the early ability of certain communities to domesticate certain plants and get a head-start on food production?¹⁰²

Although the feedback loop does not help us to answer those questions, the concept of self-reinforcing institutional disparity gives us a new framework within which to frame these questions. The metaphor of self-reinforcing monopoly seems to better fit with our intuitions about racial inequality - that three hundred years of slavery and segregation do explain a lot of current race gaps, that the racial composition of one's neighborhood makes an economic difference in people's lives, that it "takes money to make money," and that is why "the rich get richer and the poor get poorer."

Perhaps more importantly, the feedback loop story helps us to understand how racial inequality can emerge from institutional processes that operate independently of individual actors. By reframing inequality as a structural and institutional phenomenon, and not just as an individual one, policymakers can better wrestle with the possibility of social change that actually eliminates persistent racial disparities. The following chapters explore the remedies for eliminating self-reinforcing disparities in more detail.

102. JARED DIAMOND, *GUNS, GERMS AND STEEL: THE FATES OF HUMAN SOCIETIES* (1999).

APPENDIX A-1

Initial Condition Parameters

Lattice Size: 30X30

Neighborhood type: Moore Neighborhood of Range 2

Mean Black Assets: 40

Standard Deviation Black Assets: 20

Mean White Assets: 100

Standard Deviation White Assets: 40

Number of Iterations to Mobility Change: 20

Family Asset Accumulation Rate Per Iteration: 3%

Neighborhood Asset Accumulation Rate Per Iteration: 5%

Number of Sites Searched to Find Suitable Space: 50

Percent Open Space: 35%

Mutation Rate: .001 percent mutate to assets within S.D. 50

Rules for Moving:

(1) First Period Constraint: Black Families may not move into positions with any white neighbors

(2) All Periods, All Families: Move When New Neighborhood Average Assets are at least 15% greater than Old Neighborhood Average Assets Family Assets are greater than or equal to New Neighborhood Average Assets

(3) Activation: Randomized, Asynchronous: Starting with a random Family, each Family is given opportunity to move once per iteration; All families move when possible.