

Cumulative Disadvantage and Racial Discrimination

In earlier chapters, we reviewed various methods for measuring certain types of racial discrimination, including laboratory and field-based experiments (such as audit studies), statistical inference methods for observational data, and surveys of racial attitudes and experiences of discrimination. Analysts typically use these methods to identify and measure discrimination that occurs at a certain point in time within a specific domain. In this chapter, we observe that important effects of prior discrimination may be missed with these methods. The discussion expands the potential impact of racial discrimination to include cumulative effects over time, as well as the interaction between effects of discrimination experienced in one domain and at one point in time and events that occur in other domains and at other points in time.

Our concern here is with effects that operate over time. For instance, studies might measure small effects of discrimination at each stage in a domain (e.g., hiring, evaluation, promotion, and wage setting in the labor market), thus leading one to conclude that discrimination is relatively unimportant because the effects at any point in time are small. Over time, however, small effects could cumulate into substantial differences. We identify three primary ways through which discrimination might cumulate:

- *Across generations.* Discrimination in one generation that negatively affects health, economic opportunity, or wealth accumulation for a particular group may diminish opportunities for later generations. For instance, parents' poor health or employment status may limit their ability to monitor or support their child's education, which in turn may lower the child's

educational success and, subsequently, his or her socioeconomic success as an adult.

- *Across processes within a domain.* Within a domain (e.g., housing, the labor market, health care, criminal justice, education), discrimination at an earlier stage may affect later outcomes. For instance, discrimination in elementary school may negatively affect outcomes in secondary school and diminish opportunities to attend college. Even single instances of discrimination at a key decision point can have long-term cumulative effects. For example, discriminatory behavior in teacher evaluations of racially disadvantaged students in early elementary school may increase the probability of future discrimination in class assignments or tracking in middle school. Similarly, in the labor market, discrimination in hiring or performance evaluations may affect outcomes (and even reinforce discrimination) in promotions and wage growth.

- *Across domains.* Discrimination in one domain may diminish opportunities in other domains. For example, families that live in segregated neighborhoods may have limited access to adequate employment and health care.

This chapter is necessarily quite speculative. Very little research has attempted to model or estimate cumulative effects. In part, this is because modeling and estimating dynamic processes that occur over time can be extremely difficult. The difficulty is particularly great if one is trying to estimate causal effects over time. That is, we are ideally interested in measuring the presence and effects of racial discrimination at multiple points in a dynamic process.

Chapters 6 and 7 address the difficulties involved in credibly measuring the presence and effects of racial discrimination within one domain at a point in time, including the difficulty of estimating how discriminatory behavior contributes to a difference in observed outcomes. Measuring the impact of discrimination on outcomes over time is even harder. Although some research attempts to track cumulative disadvantage, there is a paucity of studies that credibly measure an effect of discrimination and trace its causal effects over time.

Because the cumulative question has rarely been discussed, this chapter begins by fleshing out the concept of cumulative effects of discrimination that we first introduced in Chapter 3. We then provide a more detailed discussion of the three avenues listed above through which cumulative discrimination may occur (across generations, across processes within a domain over time, or across domains over time). Next, we briefly describe three existing approaches (in three distinct literatures) to modeling the dynamic processes of cumulative disadvantage and discrimination. Finally, we turn to issues involved in trying to measure the magnitude and importance of cumulative disadvantage and trace out the effects of racial discrimination

over time. We sketch several possible approaches while commenting on the difficulties involved in their implementation. This measurement discussion is best viewed as describing a possible future research agenda; there has not been enough work in this area for us to make statements about which approaches are most promising or persuasive.¹

THE CONCEPT OF CUMULATIVE DISCRIMINATION

We briefly elaborate on the concept of cumulative discrimination and how it relates to other concepts and measures, making four main points. First, *by cumulative discrimination we mean a dynamic concept that captures systematic processes occurring over time and across domains.* Discrimination has cumulative effects when a discriminatory incident affects not only the immediate outcome but also future outcomes in one's own lifetime or in later generations. For example, slavery or racial exclusion of certain groups in the past that limited occupational earnings may have negatively affected wealth accumulation for future generations among these groups (Sacerdote, 2002).

One particularly interesting aspect of the dynamic processes that may generate cumulative discriminatory effects is the possibility of feedback effects (Blau et al., 1998). That is, cumulative discrimination may be more than an additive process in which the effects of discriminatory incidents sum over time to form larger and larger outcome disparities. The probability of future discriminatory events may be causally related to past discriminatory events, so that current discrimination may increase the probability of future discrimination. For example, in the education system, any bias in teachers' expectations about the academic performance of black or Hispanic elementary school students may negatively influence the students' performance (e.g., by generating self-fulfilling prophecies) (Jussim, 1989, 1991; Jussim and Eccles, 1992; Rosenthal, 2002). Over time, lower performance by such students may do the following: reinforce negative stereotypes; influence teachers' expectations about the performance of students from these groups, resulting in even poorer performance by them (see Ferguson, 1998); and lead to their experiencing greater discrimination later in life. In an example from the labor market, discrimination in job hiring could make individuals in the target group reluctant to invest in future education or training, permanently lowering their skill levels. This outcome could in turn reinforce employer prejudices and lead to ongoing hiring discrimination in the future.

¹At points in this chapter, we reference suggestions from various colleagues to whom we wrote, seeking their advice about research on cumulative discrimination.

Second, *measures of discrimination that focus on episodic discrimination at a particular place and point in time may provide very limited information on the effect of dynamic, cumulative discrimination.* For example, very small amounts of bias at each level of a multilayer organization can result over time in major bias at the top level with regard to the composition of top management (Martell et al., 1996). Similarly, the amount of discrimination measured at any one stage in a particular domain may be relatively small (e.g., racial steering of housing applicants), yet small effects cumulating over individuals' lifetimes may yield large disparities (e.g., residential segregation). Williams and Neighbors (2001) posit that examining a single instance of discrimination may result in substantially understating the overall level of discrimination. For instance, chronic, everyday exposure to small amounts of discrimination may occur in school, at work, or in public settings. Exposure to chronic discrimination can negatively affect outcomes across multiple domains throughout an individual's life course.

Third, *current legal standards do not adequately address issues of cumulative discrimination.* In the legal sense, discrimination is conceived of as an event that happens at a specific time and place, rather than as an ongoing process yielding cumulative disadvantage over time. Standards of disparate treatment and disparate impact typically focus only on the current environment and give little weight to prior discriminatory behaviors and practices that affected earlier generations, other domains, or past experiences. Therefore, the concept of cumulative discrimination is not addressed directly by current legal definitions of or legal remedies for discrimination. The greater the extent and burden of cumulative discrimination, the more powerful are the arguments for broadly tailored remedies (legal or legislative) that address large racial disparities, rather than narrowly tailored legal remedies that address specific instances of discrimination.

Fourth, *the effects of cumulative discrimination can be transmitted through the organizational and social structures of a society.* While individual discriminatory behaviors can certainly have cumulative effects, the ways in which discriminatory effects are "transmitted" across domains and over generations often depend on social organization. For instance, policies and processes that produce inequalities in housing and labor markets (e.g., segregated neighborhoods and occupations) can also produce inequalities in education (e.g., segregated schools with fewer resources) (see Mickelson, 2003). Faced with persistent discrimination and societal disadvantage, disadvantaged racial groups may make life choices under these racially biased conditions that limit their life chances and future opportunities. Hence, any discussion of cumulative discrimination will move us to closer consideration of the institutional and social processes through which disadvantage is transmitted.

Although there is a paucity of empirical work attempting to measure

the cumulative effects of discriminatory events or to determine the extent to which past discrimination causes present disadvantage, the large and continuing racial disparities in the United States are at least consistent with the possibility that cumulative discrimination is important. In this chapter, our goal is to consider possible approaches to identifying and measuring the cumulative effects of discrimination.

AVENUES THROUGH WHICH CUMULATIVE DISCRIMINATION MAY OCCUR

Cumulative Discrimination Across Generations

Discriminatory effects can cumulate over lifetimes and across many generations; that is, discrimination against parents in one generation may directly affect outcomes for their children and indirectly affect life opportunities for subsequent generations (e.g., through poorer education or poorer health). Few studies are able to link discrimination experienced by parents directly to children's outcomes, but research has suggested a variety of channels through which such a link may occur. For instance, continued racial segregation in housing has ongoing implications for wealth levels and accumulation in future generations (Conley, 1999; Oliver and Shapiro, 1995). Several researchers have found that parents' education can influence youths' educational aspirations and attainment (Duncan and Magnuson, 2001; Mare, 1995; U.S. Department of Education, 2001b). Moreover, knowledge about and expectations of going to college influence not only this generation's college attendance but also the knowledge and expectations of the next generation (Massey et al., 2003). Thus, parents who experience discrimination may socialize their children to avoid certain places or situations, or they may have educational and occupational experiences, knowledge, or goals that limit prospects for their children (see Bowman and Howard, 1985; Boykin and Toms, 1985; Hughes and Chen, 1999).

Discrimination against parents at one point in time may limit prospects for their children even if the discriminatory behavior comes to an end or the children face no discrimination. Although evidence of the impact of parental income on child outcomes is mixed, recent work suggests that parental income may be particularly important for younger children in low-income families (see Duncan and Magnuson, 2002, for a summary). For example, if parents cannot afford to live in better school districts or provide extracurricular learning opportunities, their children are likely to do worse in school. Thus, factors, including discrimination faced by parents, that limit parental income may lead to lower achievement by their children.

An ongoing debate within sociology and other disciplines concerns the extent to which outcomes for one generation persist over time and spill over

into subsequent generations (see Alba, 1990; Farley, 1990). In particular, some suggest that racial and ethnic differentials narrow and even disappear after one or two generations (Gordon, 1964; Park, 1950). Others argue that differentials persist across generations, affecting human capital accumulation (Alba et al., 2001; Borjas, 1994). Borjas finds that education and skill differentials between immigrant and native U.S. workers (based on wage data from the 1910, 1940, and 1980 censuses) are important determinants of the education and skills of their children and grandchildren. He also shows that differentials converge after four generations; however, experiences among different immigrant groups are qualitatively different and should not be generalized.² Sacerdote (2002) finds convergence in outcomes (literacy and occupation) between descendants of U.S. slaves born in the nineteenth century and descendants of free blacks within two generations after the end of the Civil War. Thus, after slavery ended, former slaves caught up to free blacks, and the large literacy gap that existed between them disappeared.³

Discrimination Across Processes Within a Domain

As individuals engage in sequential interactions in the labor or housing markets or within the health care, criminal justice, or education systems, discriminatory experiences may have cumulative effects. For instance, discrimination early in one's career may affect performance evaluations, promotions, and wages. Weinberger and Joy (2003) indicate that wage gaps are small between college-educated blacks and whites when they are first hired, but the gaps increase in the years after they leave college. This finding is at least consistent with a theory of cumulative discrimination (although there may be other explanations as well). In education, as noted above, biases in teacher expectations in the early years of schooling may affect later educational experiences and student performance (Ferguson, 1998; Jussim, 1989; Jussim et al., 1996; Murray and Jackson, 1982-1983). Ferguson, for instance, concludes that teachers' perceptions and expectations, which may build sequentially over time from kindergarten through

²Although differences (e.g., in literacy rates) were relatively low among different immigrant groups in the early twentieth century, European immigrants who were assimilated into U.S. society overcame many institutional and cultural barriers that non-European immigrants (e.g., Mexicans) did not (Alba et al., 2001). Thus, there may be slower convergence of differentials over time between non-European immigrants and U.S. natives.

³Sacerdote did not examine black-white differences but assumed there were fewer cultural and institutional barriers between slaves and free blacks than there were between blacks and whites at the time.

high school, probably contribute to black–white differences in educational achievement. Similar examples can be seen in cumulative interactions within the criminal justice or health care systems.

Single instances of discrimination that affect key outcomes may have cumulative effects even if no future discrimination is experienced. Even more problematic, discriminatory effects at one point in time may place an individual at greater risk of future discrimination, leading to even larger cumulative effects. The institutional processes that evaluate individuals and determine their progress through a system over time can be important in transmitting cumulative discriminatory effects. For instance, most schools use tracking—that is, grouping students into classes or special programs by achievement level. This process typically begins in elementary school and continues through secondary school (Alexander et al., 1999; Kornhaber, 1997; National Research Council, 1999). Several researchers have shown that track divergence occurs over time (Gamoran and Mare, 1989; Kerckhoff, 1986). Mickelson (2003) determined that racially disadvantaged students (e.g., blacks, Hispanics, and Native Americans) are found disproportionately in lower educational tracks for which curricula and instructional practices are weak (see also Hallinan, 1998; Lucas, 1999; Lucas and Berends, 2002; Mickelson, 2001; Oakes, 1985, 1994; Oakes et al., 2000; Welner, 2001; for a more extensive discussion and references, see Mickelson, 2003).

Mickelson (2001) conducted a survey of all middle and high schools in the Charlotte–Mecklenburg school district, long considered a model desegregated district. An examination of all eighth-grade middle school English placements showed that of those who scored in the highest decile as second-grade students, whites were about four times more likely to be in the highest track compared with their black counterparts. This disparity was evident even after controlling for prior achievement, family background, and other factors. Mickelson (2003) concludes that systematic track placements that differ because educators teach, advise, or schedule blacks differently than whites constitute evidence that discrimination is occurring.

Discrimination Across Domains

Discrimination in one domain may also affect outcomes in other domains. In education, discrimination may negatively affect later academic achievement, which in turn may limit access to employment opportunities and affordable housing. Discrimination in hiring can affect residential options, which can also affect schooling and employment options. Discrimination in housing markets is particularly problematic because the distribution of housing affects factors associated with place of residence, such as education, access to jobs, and home equity. Yinger (1995) estimates that

housing discrimination lowers the total net worth of black households by \$1,335 billion and of Hispanic households by \$600 billion.

Past findings on the influence of neighborhood characteristics on other domains are mixed (Jencks and Mayer, 1990). Some of the most persuasive research has occurred in recent years, as the U.S. Department of Housing and Urban Development has funded a series of randomized experiments seeking to identify the effects of residential location on family and child outcomes. The Moving to Opportunity studies are following families who volunteered for relocation out of public housing projects. A randomly assigned subset of these families received help in relocating to low-poverty neighborhoods only (with ongoing rental subsidies through Section 8 vouchers). Results to date indicate that families who moved to low-poverty neighborhoods, compared with the comparison group, have experienced higher employment rates and income, better housing conditions, less exposure to criminal activity and violence, and improved physical and mental health among adults and children (Del Conte and Kling, 2001; Ludwig et al., 2001). The results vary somewhat across different cities, but they are consistent with a review of related (nonexperimental) research by Leventhal and Brooks-Gunn (2000). Many argue that racial discrimination has been highly important in determining residential location patterns (Massey and Denton, 1993). The Moving to Opportunity studies indicate how residential location can have substantial effects on other outcomes.

There is additional research linking residential location with outcomes in other domains. For instance, the so-called spatial mismatch literature investigates how residential location may influence job finding and unemployment (Kain, 1968). Recent work suggests that spatial mismatch results in poor access to jobs, longer commutes, lower wages, and lower employment for low-skilled nonwhite workers (Ihlanfeldt and Sjoquist, 1998; Mouw, 2000). Although these findings suggest that the housing market affects labor market outcomes, studies of firm relocation indicate how exogenous changes in the labor market also affect residential location and housing (Fernandez, 1997; Zax, 1989).

Discrimination in the criminal justice system may affect various other outcomes for disadvantaged racial groups as well. Few studies make the link to discrimination, but existing research does indicate how discrimination at one stage could influence outcomes at another. Compared with whites, blacks and other disadvantaged groups are much more likely to be sent to prison and sentenced to longer periods of incarceration (Tonry, 1996). High rates of black incarceration can disrupt schooling, leading to poor employment prospects and job instability (Sampson and Laub, 1997; Western, 2002; Western and Pettit, 2002). Lochner (1999) argues that education, employment, and crime are all causally linked, so discrimination in any one area will affect other areas.

Disparities in incarceration rates also have a negative impact on the health of disadvantaged racial groups. Weich and Angulo (2002) note that prison overcrowding and lack of health care led to an outbreak of tuberculosis in the early 1990s. Fully 80 percent of known tuberculosis cases in New York City, concentrated among minorities and the homeless, were traced back to prisons (Pablos-Mendez, 2001).

Broader Consequences of a Racially Biased Society

In many cases, differences in racial outcomes are at least partially explainable by differences in the behavior of individuals. In the domain of criminal justice, for example, there is an overrepresentation of nonwhite youth across all stages of the juvenile justice system (National Research Council and Institute of Medicine, 2001). According to self-report data, victimization surveys, and arrest and conviction statistics, black youths show high rates of committing serious offenses compared with white youths. Not surprisingly, these disparities in behavior led to a public discussion focused on individual behavioral choices rather than on past discriminatory processes.

The panel understands that individuals must be held responsible for their actions in the criminal justice system as well as in the education system or the labor market. Individual actions, however, do not occur independently of the larger social and economic context. Certain behaviors by members of disadvantaged racial groups may arise in response to patterns of social and institutional behavior in a racially biased society. Evidence suggests that some behavioral differences may develop over time with differential exposure to risk factors or in reaction to past incidents of discrimination, bias, and exclusion (Cook and Laub, 1998; Sampson and Laub, 1997; Sampson and Lauritsen, 1997; Wilson, 1987). Furthermore, norms and traditions can be affected by incentives (Hobsbawm, 1992).

For instance, frequent and prolonged negative interaction between police and residents in disadvantaged communities can contribute to the overrepresentation of nonwhite youth in the juvenile justice system (Fagan, 2002; National Research Council and Institute of Medicine, 2001). Bachman (1996) found that police respond more rapidly to robberies and aggravated assaults committed by a black offender against a white victim than to those same crimes committed against a black victim or by a white offender. Bachman also found that police devote greater resources to gathering evidence for black offender–white victim crimes, a finding that suggests blacks are more likely to be arrested and subsequently convicted than whites (National Research Council and Institute of Medicine, 2001). Hence, disparities in behavior may be due in part to historical discrimination and current racial stratification.

Exposure to certain risk factors may also explain racial disparities in behavior. Prolonged exposure to risk and negative social interactions over time can influence life choices and limit future opportunities for disadvantaged racial groups. Nonwhite youths, particularly blacks, are disproportionately subject to risk factors associated with crime, such as poverty, poor health care, parental unemployment, and segregation. Youth who believe they have fewer life opportunities or who feel more alienated from mainstream economic and social institutions are probably more likely to engage in risky and self-destructive behaviors. A society that perpetuates strong racial differentials may communicate to nonwhite youth that they are not likely to succeed within mainstream society, leading them to choose alternative lifestyles.

Social isolation and concentration of poverty can marginalize poor individuals from mainstream society (Wilson, 1987). Such conditions disproportionately affect poor minorities, who, cut off from society, lack access to jobs, to higher education, and to positive role models. Without such access, concentrated poverty becomes more acute, leading to a "concentration effect" in which the most disadvantaged members of society (in this case the poorest minorities) are concentrated disproportionately in the most isolated neighborhoods. Wilson argues that social isolation leads to patterns of behavior "not conducive to good work histories," as high unemployment and dissatisfaction with the limited work available lead to altered norms of behavior, such as involvement with drugs or violence (1987:60).

Substantial research has shown that risky and maladaptive behaviors are strongly promoted in neighborhoods of concentrated poverty, many of which are themselves the products of continued racial segregation (Brooks-Gunn et al., 1997; Massey and Denton, 1993). Neighborhoods of concentrated disadvantage, in which a disproportionate share of minorities are disadvantaged or regularly treated with official suspicion, may foster cynicism toward authority and promote illegal deviant behavior (Sampson and Lauritsen, 1997). Furthermore, compounded effects may lead to large differences in future outcomes. For instance, small racial disparities at almost every stage in the juvenile justice process may be compounded through the system (National Research Council and Institute of Medicine, 2001). Thus, the outcome that blacks are disproportionately overrepresented among youth sentenced to correctional institutions—the final stage of the process—may partly result from differential treatment at earlier stages.

Current measures of discrimination that focus on identifying whether discrimination is occurring in a particular domain at a given point in time cannot capture such feedback effects, by which past discrimination affects attitudes, expectations, and behaviors, leading to ongoing and ever widening disparities in outcomes over time. It may be very difficult in such situations to identify empirically a "primary cause" or to measure the share of a

differential outcome that is due specifically to past racial discrimination. Yet even if measurement is difficult, it is clear that some adverse outcomes for nonwhites, even when based on freely made personal choices, may partially reflect current and past discrimination that should concern society and motivate the need for research and measurement.

MODELS AND THEORIES OF CUMULATIVE DISADVANTAGE

In most cases, researchers take the results from previous generations or from earlier in a person's lifetime as given and model current behaviors conditional on the past. More dynamic models—particularly those in which past discrimination in some way makes current discrimination more likely—are relatively rare. Here we briefly discuss three theoretical approaches used within three different fields of study that focus on questions of cumulative disadvantage and discrimination: (1) life-course models (criminal justice), (2) ecosocial theory (public health), and (3) feedback models (labor market). It will quickly be apparent that these three approaches (each developed largely independently within separate literatures) have certain elements in common. We present these models not because we think they provide completely satisfactory ways to model the dynamic nature of cumulative discrimination but because they provide possible starting points for future research.

Criminal Justice: A Life-Course Theory of Cumulative Disadvantage

Life-course theory posits that social and historical contexts influence and shape experiences throughout a person's lifetime. Elder (1974, 1975, 1985, 1991, 1998) has done extensive research on the societal influences that shape people's lives from childhood through adolescence and finally adulthood. One challenge of using this perspective is in separating out the effects of the social and historical contexts when examining how current behaviors affect future outcomes in a person's life.

In the criminal justice domain, Sampson and Laub (1997) propose a life-course theory of cumulative disadvantage, which posits that behavior (e.g., criminal delinquency) can affect certain social outcomes (e.g., failure in school or poor job stability) and influence future behavior (e.g., adult criminal activity). Juvenile delinquency, for example, is often linked to adult criminal behavior, as well as other deviant behaviors, such as excessive drinking, traffic violations, and domestic conflict or violence. The developmental framework of Sampson and Laub (1997:135) for understanding continued criminal behavior is based not only on individual behavior but also on "a dynamic conceptualization of social control over the life course." They believe cumulative disadvantage is the result of negative interactions

with various key institutions of social control—family, friends, school, and the criminal justice system—that can exacerbate delinquent behavior.

Sampson and Laub argue that cumulative disadvantage results in negative consequences and social sanctions that limit life chances. Thus, societal reactions to criminal delinquency may lead to further deviance, creating a snowball effect: Early delinquency can have negative consequences—arrest, conviction, and incarceration—that limit later opportunities and affect future life chances. Early criminal conviction and incarceration may disrupt schooling and often lead to poorer employment prospects and job instability later in life (Bondeson, 1989; Freeman, 1991; Hagan, 1993; Kasarda and Ting, 1996). Moreover, the length of juvenile incarceration is predictive of subsequent job stability, even after controlling for prior criminal behavior or other delinquencies, such as excessive drinking (Sampson and Laub, 1993).

This model does not directly address the effects of discrimination, although it is apparent that discrimination in the processes that lead a young person to be labeled “deviant” (in the schools or in the juvenile justice system) can contribute to these negative effects. Sampson and Laub (1997) present a theoretical discussion, without attention to how that theory might be tested empirically. The model is complex, with a host of variables that are difficult to measure. It is not obvious how one would identify and trace the causal factors involved through actual longitudinal data. The model is also quite specific to one particular type of disadvantage—related to the labeling and treatment of adolescent offenders—and is thus not directly applicable to a large area of cumulative disadvantage or discrimination.

Public Health: Ecosocial Theory

As in criminal justice research, there is growing recognition in the domain of epidemiology and public health of the importance of the life-course perspective (see Barker, 1998; Kuh and Ben-Shlomo, 1997). In public health, this approach emphasizes how “health status at any given age, for a given birth cohort, reflects not only contemporary conditions but embodiment of prior living circumstances, in utero onwards” (Krieger, 2001:695). Research on health from the life-course perspective examines cross-generational effects of economic deprivation and discrimination, such as how health deficits among African American mothers in poverty (over their life course) affect the well-being of their infants (see, e.g., Lillie-Blanton et al., 1996; Williams and Collins, 1995). Other research has emphasized that one’s own income, which can obviously be dampened by discrimination, has an important influence on one’s health (Case et al., 2002; Deaton, 2003).

Krieger (1994) proposes an ecosocial theory of cumulative disadvantage for health status due to discrimination over the life course. This theory

is based on the assumption that the disparate social and economic status of dominant and subordinate groups leads to differences in their health status. The ecosocial framework, like life-course theory, examines pathways between social experiences and health outcomes. According to Krieger (1999, 2000), cumulative exposure to discrimination can occur through a variety of pathways, including economic and social deprivation, exposure to toxic substances and hazardous conditions, socially inflicted trauma (such as repeated instances of discrimination), targeted marketing of harmful substances, and inadequate health care. Krieger maintains that these pathways may lead to the embodiment or biological expression of experiences of discrimination. For example, economic deprivation can limit access to affordable and nutritious food, which can lead in turn to later health problems (e.g., high blood pressure). Likewise, residential segregation and inadequate access to quality health care can result in higher infant mortality and morbidity.

A small but growing body of literature examines the somatic and mental health consequences of past exposure to racial discrimination (e.g., Mays et al., 1996; Williams and Williams-Morris, 2000). Williams and Neighbors (2001) discuss some laboratory and epidemiological studies using self-report measures, and Krieger (1999) reviews a range of approaches examining the association between institutional discrimination (e.g., residential segregation) and health outcomes within a population. Because this empirical literature is some of the only research linking past experiences of discrimination in one domain with adverse outcomes in another, we describe it further here; as discussed below, however, it may be difficult to draw causal conclusions from much of this work.

Typical laboratory studies in this area use mental imagery, film portrayals, or real-life perceptions of discrimination to measure the effects of exposure to racial bias on health outcomes (see Williams and Neighbors, 2001, for references). For instance, Blascovich et al. (2001) conducted a laboratory experiment in which they manipulated the saliency of stereotype threat (i.e., the threat of being perceived stereotypically) for black participants. Blacks who faced high (versus low) stereotype threat were more likely than whites to show increases in blood pressure. As discussed in Chapter 6, these types of laboratory studies cannot describe the actual occurrence of discrimination over long periods of time, and the findings obtained are not easily generalized to the broader population. Nonetheless, such studies can provide an indication of the explanatory mechanisms that may link past discrimination to current health problems.

Other researchers use statistical methods to relate past experiences of racial disparity and discrimination to current health outcomes. Krieger (1999) notes that the basic strategy is to adjust for factors, such as socioeconomic status, that may explain the observed disparity, then infer discrimi-

nation as a possible explanation for any remaining disparity. Williams and Collins (1995) and Lillie-Blanton et al. (1996) review the evidence from studies examining socioeconomic status and racial disparities in health outcomes (e.g., infant mortality, hypertension, and substance abuse). Using self-reported information on past experiences of discrimination, Krieger (1990), Krieger and Sidney (1996), and others (for a review, see Krieger, 1999; Williams and Neighbors, 2001) have found that exposure to discrimination is positively related to higher levels of chronic high blood pressure and hypertension in blacks. For instance, Krieger and Sidney (1996) used large-scale survey data from the multiyear Coronary Artery Risk Development in Young Adults study to examine the association between self-reported experiences of discrimination and blood pressure.

The problems with such approaches are discussed in Chapters 7 and 8. Studies that relate past racial disparities to current health outcomes may not account for unmeasured factors, such as diet and exercise, that may be correlated with race and the observed outcome but that may not be due to discrimination. Analysis that relies on self-reported past measures of discrimination may also be difficult to interpret in any causal way. People who experience high levels of stress may perceive more discrimination or may misattribute nondiscriminatory behavior to discrimination, overestimating the effect. Krieger (1999) notes a variety of problems with the use of self-reports on past discrimination in the health literature.

This health-based ecosocial perspective on the impact of discrimination has many similarities to the life-course theories of criminal justice outcomes. Both focus on differences in treatment that may have long-term behavioral and outcome implications. The ecosocial literature focuses much more on the impact of cumulative discrimination (as opposed to cumulative disadvantage) and provides a clear theoretical discussion of the pathways by which discrimination *per se* can affect health outcomes over time.

Krieger (1999), in particular, offers some ways to study exposure to discrimination and its effects on health outcomes. She suggests better measures, including experimental studies, in-depth interviews, and large-scale surveys, for capturing exposure to discrimination as well as cumulative exposure over the life course. She emphasizes that these measures should include the level and context of discrimination as well as the onset, frequency, and length of exposure. Williams et al. (2003) also lay out a research agenda for future work. Several researchers have studied the impact of racial discrimination on health outcomes and have made suggestions for improving approaches to measure discrimination in health care (e.g., Darity, 2003; Harrell et al., 2003; Krieger, 2003; Williams et al., 2003). These researchers are careful to note that much of the work in this area is in its infancy, and additional work is required to identify the best methods to measure these associations.

Labor Market: Feedback Models

Feedback effects—whereby past discriminatory events may change future behavior and increase the likelihood of future discrimination—are one way to examine cumulative effects over time; indeed, behavioral feedbacks are embedded in the life-course and ecosocial theories described above. Because of the difficulty of identifying and measuring feedback, there is little empirical work in this area (for exceptions, see Johnson and Neal, 1998; Weiss and Gronau, 1981). This paucity of research makes it difficult to trace the extent to which aggregate outcome differences may be influenced by past discriminatory incidents.

Within the field of labor economics, many researchers have emphasized the importance of feedback effects in analyzing gender and racial discrimination and have developed models of how such effects may occur (e.g., Arrow, 1973; Blau, 1977; Blau et al., 1998; Johnson and Neal, 1998; Lundberg and Startz, 1983, 2000; Weiss and Gronau, 1981). Blau et al. (1998:214) explain the cycle of feedback effects in the labor market for women: "Discrimination against women in the labor market reinforces traditional gender roles in the family, while adherence to traditional roles by women provides a rationale for labor market discrimination." Even a small amount of discrimination can have large effects if women are discouraged from investing in skills, are more likely to opt out of the labor force, and are more likely to rely on their husbands for economic support, hence reinforcing gender roles at home. Policies that help decrease discrimination will also have a feedback effect "as the equalization of market incentives between men and women induces further changes in women's supply side behavior" (Blau et al., 1998:214).

Weiss and Gronau (1981) examine the interaction of labor force participation and wages at different stages in the life cycle and the implications for earnings differences by sex. They posit that earnings in the labor market depend on past participation and investment patterns as well as future participation plans. They also argue that "differences in earnings growth reflect differences in participation plans" (p. 616). Thus, women who expect to participate less in the labor market over time will invest less in raising their earnings capacity. In part, earnings differentials by sex or race may be explained by differences in human capital; however, discrimination may also play a role. For instance, discrimination against women in the labor force can affect patterns of participation or investment. Moreover, expected discrimination may lead to more labor force exits and longer periods spent outside the labor force.

Others have argued that blacks who anticipate lower future returns to skills—possibly as a result of discrimination—may invest less in acquiring those skills (Arrow, 1973; Coate and Loury, 1993; Lundberg and Startz,

1983). The result may be a self-fulfilling prophecy among blacks that perpetuates prejudice, limits opportunities (Krueger, 2002), and sustains racial disparities in the labor market. For instance, Johnson and Neal (1998) note a racial disparity in the number of hours worked by young black and white employees with similar skills. This disparity has a cumulative effect in that differences in weeks of past work experience contribute to the black-white earnings gap. Differences in past work experience may be the result of limited access to employment or job networks but may also be the result of employer discrimination. Moreover, black disadvantage in access to job networks may itself be the result of employer discrimination and may persist even when discrimination is no longer present. Thus, feedback effects may yield negative consequences for black workers who work less because of the lower rewards to work and who subsequently earn less over time. This result is in line with other findings that individuals who experience discrimination engage in behaviors to avoid potential discrimination in the future (Essed, 1991; Feagin, 1991).

An alternative approach is offered by Lundberg and Startz (2000), who model persistence in racial differentials by allowing feedback between individual skill acquisition and community influences. They refer to their model as a model of human capital externalities. In this framework, impoverished communities have less social capital; this in turn affects the human capital acquired by individual members of the community. The result is the persistence of racial differentials, even in the absence of explicit discrimination.

In contrast to the life-course or ecosocial theories discussed above, these labor market theories are more focused and less sweeping in the phenomenon they purport to describe. They tend to provide a clear description of how a particular type of behavior or incentive at one point in time influences behavior at another point in time. They are more mathematically defined, with feedback effects modeled in precise ways. These properties provide a more satisfying description of the particular phenomenon addressed by a theory, but they can limit generalizability. There have been efforts to estimate and measure these feedback effects within the labor market literature; as in other areas, however, it is challenging to measure the right variables and to resolve the identification issues involved in tracing actual discrimination effects over time.

MEASURING CUMULATIVE DISCRIMINATION

In earlier chapters, we discussed the major difficulties involved in measuring credibly and accurately the impact of discrimination within a domain at any point in time. It is even more difficult to measure cumulative effects. This section does not provide a definitive assessment of how to

measure cumulative discrimination; rather, we discuss a variety of possible approaches. As noted above, this discussion should be viewed as a suggested research agenda that might be pursued by those interested in trying to determine the importance of cumulative effects relating to discrimination.