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Abstract

This article examines how workers respond to changes in the racial composition of their workplaces. An analysis of the job histories of new hires into multiple workgroups within a single firm reveals path dependence in the effects of group composition on turnover. Exit rates are inversely related to the level of same-race representation at the time of organizational entry, and increase when workers experience declines in representation. However, turnover rates do not decline in response to increases in representation. The challenge of workplace racial integration therefore lies not simply in eliminating discrimination in hiring, but also in managing the post-hire dynamics of changes in group composition. Implications of the asymmetric effects of compositional change for the literature on organizational demography are also discussed.

The Organizational Demography of Racial Employment Segregation

The racial segregation of employment is a pervasive feature of the American labor market and is an important source of social inequality. Reskin, McBrier and Kmec (1999) estimated that minorities are substantially underrepresented in over half of US establishments. Tomaskovic-Devey (1993), using a sample of jobs in North Carolina, estimated that almost 55 percent of blacks would have to switch jobs with whites to achieve complete integration. In a study of segregation across establishments, Bayard et al. (1999) found that a randomly selected black employee worked in an establishment with 22 to 29 percent more black employees than a randomly selected white employee. Comparing whites and Hispanics, they found that Hispanics worked in establishments that were 32 percent more Hispanic. Employment segregation is in turn implicated in racial disparities in income and social advancement. Incumbents of jobs dominated by nonwhites receive lower pay (Tomaskovic-Devey 1993; Baron and Newman 1989; Bayard et al. 1999; Sorensen 1989) and have higher turnover rates and lower promotion rates (Barnett, Baron and Stuart 2000) than incumbents of jobs dominated by whites.

Despite the importance of racial employment segregation, its causes have received surprisingly little attention in the sociological literature, particularly when compared to the voluminous literatures on the causes of sex segregation in employment (e.g., Reskin 1993) and of racial residential segregation (e.g., Massey and Denton 1993). This may reflect the fact that the levels of racial segregation in employment are less pronounced than levels of sex segregation in employment (King 1992) and levels of racial residential segregation (Becker 1980).

However, the dynamics of racial employment segregation are an important subject of study, particularly since the racial and ethnic diversity of the American labor force has increased substantially in the past several decades (U.S. Bureau of the Census 2001). In light of the connections between employment segregation and inequality, it is important to understand the forces that affect the likelihood of creating racially integrated workplaces in the face of demographic change.

As a guide to this topic, the existing sociological theory and evidence on racial segregation suffers from two limitations. First, most sociological studies focus on racial segregation across occupations or jobs (Kaufman 2002; Semyonov et al. 2000; Fossett, Galle and Kelly 1986), not establishments (Becker 1980 is an exception). One reason for this is that there has been little data available on racial segregation at the establishment or workplace level. Yet this emphasis is unfortunate, since it is within firms that work is organized and that many of the processes generating segregation play out (Baron and Bielby 1980; Reskin and Roos 1990). For example, an extensive literature has demonstrated that organizations play a crucial role in shaping the structure of sex segregation (Bielby and Baron 1986) and that the gender gap in wages virtually disappears once the segregation of men and women across establishments is taken into account (Petersen and Morgan 1995). In short, aggregated analyses of racial employment segregation that suggest relatively modest levels of segregation may conceal higher levels of segregation at the workplace level. Indeed, by surveying workers about the firm-level racial composition of their jobs, Tomaskovic-Devey (1993) found substantially higher levels of racial segregation than found in occupational studies.

A second shortcoming of the existing literature on racial employment segregation is that theoretical explanations typically focus on “pre-hire” factors, such as supply and demand in the labor market and employer hiring practices (Reskin, McBrier and Kmec 1999; Tomaskovic-Devey 1993; Kaufman 2002; Muow 2002). In a strong version of this approach, Reskin, McBrier and Kmec (1999: 338) argue that “the sex and race composition of establishments that are indifferent to a worker’s race and sex and that use sex-and race-neutral recruitment methods should be roughly proportional to that of the supply of qualified workers in the labor pool.” However, this claim only holds if one assumes that there are no “post-hire” dynamics that affect workplace composition. While market forces and hiring practices may determine who is brought into the workplace, they are not the only determinants of who stays. Group composition is the net result of both differential recruitment and differential turnover, but pre-hire explanations are best suited to account for differential recruitment patterns. In principle, the segregation of workgroups can result from differential turnover rates alone. If these forces are strong enough, a demographically skewed workplace can result even if an employer is perfectly neutral in its hiring practices and strives to bring in employees that perfectly mirror the racial composition of the local labor market.

This suggests that the prevailing emphasis on how pre-hire forces shape segregation should be complemented by an examination of post-hire dynamics. This paper investigates an important type of post-hire demographic process, namely how people respond to the demographic composition of their workgroups. Extensive research suggests that group composition has wide-ranging effects on individual and group outcomes (Mittman 1992). In particular, evidence from studies of workgroups suggests that there is a negative relationship – in

the cross-section – between group racial heterogeneity and individual attachment to the group (see Williams and O'Reilly 1998 for a review) and job satisfaction (Wharton, Rotolo and Bird 2000; Mueller et al. 1999). From the standpoint of understanding the processes generating segregation, then, it is particularly important to understand the effects of group composition on turnover.

It is also important to understand how people respond to *changes* in the racial composition of their workplaces. Consider the challenges involved in transforming a segregated workgroup into a racially integrated one. Typically, it is not feasible to achieve demographic balance through a wholesale reallocation of employees across workgroups. Integration therefore has to occur in small increments. While well-intentioned employers may encourage such integration by changing recruitment patterns, such efforts will falter if the members of the under-represented groups refuse to stay, or if members of the formerly dominant group leave in large numbers. The potential difficulties involved in creating integrated workplaces are well illustrated by considering the analogous case of the barriers to neighborhood integration. Residential segregation is in part due to forces comparable to the pre-hire explanations emphasized in the literature on employment segregation: the persistence of widespread discrimination against blacks in housing markets (Massey and Denton 1993), and the reluctance of whites to move in to neighborhoods with more than a modest representation of blacks (Farley et al. 1994). Yet extensive evidence also suggests that the process of change is itself volatile: one reason neighborhood integration remains elusive lies in the dynamics of resident's responses to changes in the racial composition of their neighborhoods, as captured in the notion of "white flight" (Schelling 1971; Granovetter 1978; Clark 1991; Crowder 2000). In Schelling's (1971)

“tipping” model, for example, integration is very difficult to achieve due to the self-reinforcing dynamics of individual responses to small changes in neighborhood composition.

The challenge of workplace integration therefore lies not simply in eliminating discrimination in hiring, but also in managing the post-hire dynamics of changes in group composition. Yet existing research provides no answer to the question: How do workers respond to changes in the racial composition of their workplace? Existing studies of the relationship between group racial composition and turnover rely on cross-sectional comparisons *across* groups, and are therefore not directly informative about the consequences of compositional change *within* workgroups. In order to investigate this issue, I present a quantitative case study of the relationship between changes in workgroup racial composition and worker turnover rates. Drawing on the personnel records of a single, large firm, I analyze the turnover rates of 1,686 new hires spread among 263 separate workplaces within the firm. These workplaces are small enough that their members interact regularly, meaning that the workplace’s demographic composition is likely to be salient to its members. A unique feature of these data is that they are longitudinal, which means that the racial composition of each workplace can be continuously updated as it changes in response to the entrance and exit of employees of different races. To my knowledge, this is the first study to examine explicitly how workers react to changes in the racial composition of their workplace. These reactions turn out to be complex, and suggest that the causes of racial employment segregation are better understood if post-hire dynamics are taken into account.

Accounts of Racial Employment Segregation: Pre-Hire Factors

Prevailing accounts of racial employment segregation emphasize factors that operate prior to organizational entry, in particular labor market supply and demand forces (Tomaskovic-Devey 1993; Reskin, McBrier and Kmec 1999; Kaufman 2002). Supply-side explanations see the distribution of individuals across jobs and workplaces as the outcome of an underlying demographic distribution of human capital and skills. From this perspective, employment segregation is the result of different skill requirements across jobs and systematic racial differences in human capital. In particular, segregation in the educational system and other factors contribute to differences in the distribution of skills by race (Farkas and Vicknair 1996), leading to higher racial segregation in jobs with greater general skill and training requirements (Kaufman 1986, 2002; Tomaskovic-Devey 1993). An alternative supply-side explanation points to the role of pervasive residential segregation and its implications for the matching of workers to jobs (Holzer 1991; Moss and Tilly 2001; Muow 2002). Historical patterns of migration and contemporary neighborhood segregation processes lead to the creation of local labor markets that vary in racial composition. If employers rely on local labor pools, workplaces will reflect this uneven racial distribution. Muow (2002) estimated that approximately 10 percent of the observed workplace segregation of blue-collar employees in four urban areas is due to residential segregation.

Demand-side explanations for racial employment segregation emphasize hiring discrimination by employers. Statistical discrimination arguments suggest that the segregation of employment reflects differences in the average productivity of different races in particular jobs. In the presence of such group differences, it can be efficient for employers to reduce

screening costs and use easily observable indicators, such as race, to sort prospective employees on the basis of expected productivity (Aigner and Cain 1977). Whether or not such group differences in productivity actually exist, evidence suggests that employers act as if they do (Moss and Tilly 2001; Baron and Bielby 1986). Racial stereotypes may also extend to expectations about appropriate and inappropriate jobs and tasks for different races (Moss and Tilly 2001; Kaufman 2002). Segregation may also be a result of over racism on the part of employers (Neckerman and Kirschenman 1991) and resistance by whites to the entry of other races (Lieberson 1980).

An alternative demand-side approach focuses on the hiring practices used by employers. Segregation may be reproduced through the use of informal hiring practices, particularly hiring through employee social networks. Personal networks play an important role in the job search process (Granovetter 1995) and tend to be highly segregated by race (Marsden 1987). Moss and Tilly (2001) argued that formalized employment practices are more likely to lead to changes in workforce composition. Muow (2002) estimated that approximately 10 percent of the observed workplace segregation of blue-collar employees in four urban areas can be attributed to the combination of informal hiring practices and racial homophily in social networks. Using a case-study of hiring in one firm, Petersen, Saporta and Seidel (2000) found that while ethnic minorities were not disadvantaged in the screening phase, they lacked access to the referral networks used by the firm and hence were less likely to reach the screening phase.

Despite the theoretical emphasis on pre-hire forces, most empirical studies of racial employment segregation use post-hire data -- that is, data characterizing the existing stock of

employees.² For example, Kaufman (2002) uses data from the 1990 U.S. Census to investigate the effects of labor market supply and demand forces on the distribution of black and white men and women across cells defined by the intersection of occupation and industry. Similarly, Tomaskovic-Devey (1993) uses data on the composition of jobs (within firms) to test supply- and demand-side arguments. However, the observed distribution of the races across jobs or occupation-industry cells is a product not only of differences in the likelihood of entry by different demographic groups, but also a product of differences in turnover rates. While turnover rates are in part a function of supply and demand forces in the labor market (e.g., through headhunting practices), voluntary turnover also depends on how people respond to their work environments, and in particular workplace demography (Pfeffer 1983).

Organizational Demography: Group Composition and Turnover

A large number of studies indicate that demographic heterogeneity, particularly with respect to easily observable characteristics, lowers individual attachment to the group and thus increases turnover rates (Williams and O'Reilly 1998). Several studies look specifically at the impact of racial diversity in workgroups, and generally find that higher levels of diversity lower attachment. Studying 151 work groups in three different organizations, Tsui, Egan and O'Reilly (1992) found that people working in teams with greater racial diversity had lower levels of psychological commitment to the organization, less intent to stay, and higher rates of absence

² Fernandez and Sosa (2003) make the same point with respect to the sex segregation of employment. The relative merits of different pre-hire explanations are tested more precisely using data on actual hiring practices (e.g., Petersen, Saporta and Seidel 2000; Fernandez and Weinberg 1997; Fernandez and Sosa 2003) than post-hire data.

from work. In a study of 45 teams in three firms, Pelled, Eisenhardt and Xin (1999) found that racial diversity increased reported emotional conflict in the team. Racial heterogeneity in workgroups also appears to lower reported job satisfaction (Wharton, Rotolo and Bird 2000; Mueller et al. 1999). Other studies, many based on laboratory experiments, reach similar conclusions (Williams and O'Reilly 1998).

Organizational demographers typically invoke one of two social psychological mechanisms to explain why racial heterogeneity in groups leads to lower attachment (Williams and O'Reilly 1998). Social categorization and similarity/attraction theories emphasize different mechanisms, but for both the crucial driver of attachment is the extent to which group members have opportunities for same-race contact. Social categorization theory argues that people construct social identities by using salient social categories to define others as either similar or different from themselves (Turner et al 1987). The resulting in-group and out-groups become a fundamental dimension along which individuals compare themselves to others. The desire to maintain high levels of self-esteem leads to enhancements in the evaluation of others who are perceived to be similar to one self (the in-group), and a devaluation of members of the out-group (Tajfel and Turner 1986). Consistent with this argument, research suggests that the experimental activation of social boundaries leads people to view in-group members as more honest, trustworthy and cooperative than members of the out-group (Tajfel 1982). As Flynn, Chatman and Spataro (2001) put it, "people who are demographically different ... will be perceived by their colleagues more negatively, on average, and those who are demographically similar to others ... will be perceived by their colleagues more positively, on average." Since race is a salient social category in the contemporary United States, this suggests that higher levels of

same-race representation in a work group should be associated with more positive sentiments toward co-workers and greater attachment.

While social categorization theory emphasizes avoidance of the out-group, similarity/attraction arguments suggest that group composition is important because it shapes the ability of people to generate friendship ties within the group. The similarity/attraction principle (Berscheid and Walster 1978) suggests that people are attracted to and more apt to like others who are similar to them along some salient dimension. People with similar demographic characteristics, for example, are more likely to have had similar experiences, which increases the likelihood that they will positively reinforce one's own beliefs. Extensive research on homophily shows that people tend to be friends with similar others (e.g., Lazarsfeld and Merton 1954; Marsden 1987; see McPherson, Smith-Lovin and Cook 2001 for a review). Race is a particularly important dimension of homophily. Marsden (1987) reports that only 8 percent of respondents in the General Social Survey report discussing important matters with a person of another race. Lincoln and Miller (1979) found racial homophily in personal networks in five different workplaces, and found that friendship ties were more likely to be racially homophilous than instrumental ties. Ibarra (1995) also found substantial racial homophily in worker's personal networks, although under-represented minorities exhibited less homophily than the members of the majority.

As this last result suggests, racial homophily is in part a product of constraint (McPherson, Smith-Lovin and Cook 2001), since the unequal population sizes of the different races in the United States and their broader segregation in society creates limited opportunities for social contact between members of different races (Blau 1977). While this means that much

of the observed homophily may be generated by chance, friendship patterns are more homophilous than would be expected by chance, even after controlling for the unequal distribution of the races through social structure (Shrum et al. 1988). The importance of homophily in intimate relations is suggested by Ibarra's (1995) finding that minorities were more likely to develop social support networks that spanned outside the workgroup.

As Popielarz and McPherson (1995) argue, the principle of homophily works in two ways with respect to the relationship between group composition and turnover. If a person has the opportunity to develop same-race ties within the workgroup, such personal attachments will likely increase commitment to stay and lower turnover. Yet if, in the search for same-race friends, a person must reach outside the group, such ties are likely to pull him or her away from the group. Popielarz and McPherson (1995) show that such processes operate among voluntary associations, and suggest that it is an important source of the striking degree to which voluntary associations are demographically homogeneous (McPherson and Smith-Lovin 1987): "group homogeneity results from the fact that members who are typical of the association stay in the group longer, while atypical members leave the group at a higher rate" (Popielarz and McPherson 1995: 699). Although friendship is likely a more important determinant of group attachment in voluntary associations than in work groups, personal networks play an important role in workgroups, both in affecting psychological satisfaction with the job and as conduits for information about new job opportunities that might lead to exit (Fernandez, Castilla and Moore 2000).

In summary, whether the emphasis is on avoidance of people of a different race (as in social categorization theory) or on attraction to similar others (as in similarity/attraction theory),

organizational demography research suggests that differences in turnover rates can be attributed to the racial composition of the group. The greater the same-race representation, the lower the turnover rate.

The Effects of Changes in Racial Composition

Movement toward workplace racial integration typically requires incremental changes in the composition of workgroups. The existing research in organizational demography is however largely silent on the question of how changes in group composition affect attachment and turnover. This is to a large extent because existing studies rely on cross-sectional comparisons across workgroups (Williams and O'Reilly 1998). It is tempting to draw conclusions about the consequences of compositional change from these cross-sectional comparisons, but this would be a mistake. Doing so would require making the strong assumption that there is no path dependence in the effects of racial composition. At least with respect to one demographic characteristic (team tenure), however, evidence suggests that there is path dependence in the effects of group demography, such that people in identical groups behave differently if they have different demographic histories (Sørensen 2000).

The hazards of cross-sectional research result from the fact that groups with identical demographic distributions may have arrived at those distributions in any of a number of different ways. Figure 1 presents a hypothetical example contrasting three groups with six members each. The groups vary in their racial composition at the first time point but have the same composition at the second time point, at which point they are evenly divided between the two races. Consider the experience of the three individuals represented by the square in the lower-left hand corner in

each group. Assume that these people experience their group's demographic change between the first time point and the second; the person in group A experiences a decline in same-race representation while the person in group C experiences an increase. A cross-sectional study at the second time point of the relationship between group composition and turnover would predict that these three individuals should, other things being equal, have the same likelihood of turnover, since the composition of the three groups is the same. Yet this assumes that the process of change has no direct effect on individual attachment, and that it does not moderate the effect of group composition. If past histories are relevant but not measured, however, individual unobserved heterogeneity results. Any comparison of otherwise identical individuals across the three groups has to take into account the possibility that the process of demographic change may affect attachment above and beyond any cross-sectional effects of demographic composition (Sørensen 2000).

Further consideration of the example in Figure 1 raises the interesting question of whether growth and decline in same-race representation have symmetric effects. Consider again the two identical individuals in group A and group C. If attachment is a positive function of same-race representation, then we would expect a higher level of attachment at the first time point for the person in group A, relative to the person in group C. However, the comparison at the second time point suggests that they should have the same level of attachment. In order to generate this result and still allow for path dependence, we would have to assume that the effect of a decline in same-race representation is the same as the effect of an increase. The person in group A becomes more unhappy (less attached) as same-race representation falls, and the person in group C becomes happier (more attached) as same-race representation increases. Existing

theories of organizational demography appear to imply this symmetric pattern. Both social categorization theory and similarity/attraction suggest that attachment should be a positive function of same-race representation in the workgroup. While these theories do not articulate an explicit theory of the change process, it is reasonable to infer that this implies that increases in same-race representation should heighten attachment (and lower turnover rates), and decreases should lower attachment (and raise turnover).

It is not obviously true, however, that increases and decreases in same-race representation should have symmetric effects. While such a relationship is consistent with the existence group segregation, it is not a necessary condition. An instructive alternative expectation about the effects of change comes from tipping models of neighborhood residential segregation. Tipping or threshold models (Schelling 1971; Granovetter 1978) center on a discontinuous function relating the racial composition of a neighborhood and a person's willingness to stay in the neighborhood.³ People will stay in the neighborhood as long as same-race representation remains above a minimum tolerance level. But once same-race representation falls below the tolerance level, people exit. People considering moving into a neighborhood will only do so if the racial composition satisfies exceeds their tolerance level.

Schelling's analysis of this model shows quite clearly that seemingly small differences in tolerance thresholds between the races can lead to high levels of segregation, even if most whites and blacks are willing to live in more integrated neighborhoods. A key result is that a integrated

³ In Schelling's (1971) model of neighborhood racial segregation, people are assumed to have a maximum tolerance level with respect to the presence of another race. Since Schelling (and others) operates with a two-race model (whites and blacks), the threshold can also be cast as a minimum tolerance level with respect to same-race representation.

equilibrium is very difficult to achieve and very unstable. Small changes in neighborhood racial composition can lead to an accelerating process where the departure of members of one race leads to their replacement by members of the other race, followed by the departure of additional people of the first race etc. Evidence suggests that differences in neighborhood preference do exist among the races (Farley et al., 1994), and that the racial differences in preferences are larger than required to set in motion Schelling's tipping process (Clark 1991). Moreover, these racial preferences for same-race representation in neighborhoods are not limited to blacks and white. In a study of whites, blacks, Hispanics and Asians in Los Angeles, Clark (1992) found that all four racial groups exhibited in-group preferences in neighborhood composition

One reason why the Schelling model leads to high levels of segregation lies in its assumptions about the shape of individual preference functions. While it is assumed that there is a minimum level of same-race representation that must be met, there is no upper limit to the same-race representation that people will tolerate. In short, there are no preferences toward desegregation. The absence of an upper limit means that people are willing to live in a neighborhood that is fully segregated, even if they would have accepted a non-zero proportion of the other race. Consistent with this, in a study of Detroit respondents, Farley et al. (1994) found that the vast majority of whites and blacks were willing to move into a neighborhood composed almost exclusively of their own race.

Furthermore, notice that in the Schelling model segregation results even though there is no assumed benefit to increases in same-race representation *above* the threshold. People will leave the neighborhood if same-race representation falls below the threshold, but there is no necessary assumption that their attachment to the neighborhood grows with increases above the

threshold. The Schelling model therefore has interesting implications for our expectations surrounding the effects of changes in racial composition. First, as long as the threshold is met, increases in same-race representation may have no impact on willingness to stay. Second, declines in same-race representation are more likely to generate turnover, since only declines can lead to a failure to satisfy the threshold. Assume, for example, that people only join a workplace if the extent of same-race representation in the workplace meets or exceeds their minimally acceptable level. Further increases in same-race representation have no impact on the acceptability of the workplace: the threshold has already been met. Declines in same-race representation, however, may drive the proportion below the threshold, and induce the employee to look elsewhere for work. This suggests the importance not only of examining the consequences of demographic change, but more importantly of distinguishing between the effects of increases and decreases in same-race representation.

Data and Methods

I examine the relationship between changes in group racial composition and turnover through a quantitative case study of multiple workgroups in a single firm. The primary reason for studying a single firm is that studying the effects of compositional change requires over-time data on entire workgroups. Short of doing a prospective study on a representative sample of organizations, this forces a reliance of archival data such as personnel records. Such data are difficult to assemble on a large scale. Instead, I exploit the richness of data that results from focusing on a single firm to explore a richer set of empirical processes than have been examined in past research (see Fernandez, Castilla and Moore 2000; Petersen, Saporta and Seidel 2000 for

similar strategies). However, a drawback of this approach is that relying on evidence from a single firm limits the empirical generalizability of the results.

I analyze the job histories of a cohort of new hires into the retail branches of a large multi-divisional financial services institution. Access to the data was provided on the condition that no identifying information on the firm be revealed. The data come from annual personnel files provided by the company for the period from January 1, 1996 to May 31, 1999. These files cover all employees in the firm's U.S. operations, which are quite wide-ranging. One of the advantages of personnel records is their comprehensiveness; the personnel records contain, for example, data on the exact timing of entry and exit of all employees from the company over the time period covered. However, the tradeoff associated with this kind of longitudinal research is that one cannot measure the intervening psychological variables (such as psychological commitment or attachment) that have become the focus of much recent organizational demography research. Instead, we must infer the level of attachment through the individual turnover rate.

The nature of the data set forces two (related) decisions: how to select work groups within the firm, and which employees to study. In selecting work groups, we want to insure that there is the possibility of some minimal level of workplace interaction between the group's members, since organizational demography arguments presuppose social interaction between group members. In light of this, the firm's retail branches are an attractive research setting. The firm assigns each retail location a unique organizational code, ensuring that employees assigned to a branch are physically co-located. The retail branches are modest in size (with a mean of approximately 12 full-time equivalent employees in the sampled branches) and are focused

around a common set of tasks aimed at providing service to retail financial service customers. A further advantage is that by choosing workgroups that perform the same function within the firm's division of labor, I reduce the degree of unobserved heterogeneity across groups.

The firm was founded well before 1996, so a second limitation of the personnel records is that the job histories of employees hired before 1996 are left-truncated; in particular, one cannot know the demographic composition of an employee's work group before the onset of the data. For this reason, I selected for analysis all employees hired into branches subsequent to January 1, 1996. New hires were only included if this was their first job at the firm. For these employees, I can measure the demographic composition of the workplace continuously from the time of entry into the firm until they leave the firm or the data is censored in mid-1999.

These data selection rules resulted in a data set covering 1,686 employees from 263 distinct branches. Given that many of these people are hired into entry-level jobs in the firm, there is a fair amount of turnover, with the median time until exit being 31.6 months. I defined turnover as occurring when employees left the firm as a whole. Employees could also transfer out of the retail branch into other parts of the firm; these spells were censored, as this type of turnover is less clearly a product of low attachment to the group.

Measures

A distinct advantage of this data set is that it contains the demographic characteristics not only of the focal employees who are tracked from the time of hire, but also of all other employees at the branch, regardless of the date of hire. I can therefore continuously measure the demographic composition of the branches from the time a sampled employee is hired into the

branch until the time of exit or censoring. The demographic variables are time-varying covariates that are updated every time someone joins or leaves a branch, including the departure of people hired before 1996.

An important issue is the appropriate measurement of diversity. Many of the cross-sectional studies in organizational demography research use group-level diversity measures, such as Blau's index of heterogeneity or entropy-based measures. However, group-level measures are problematic in the study of compositional change, because they obscure the fact that an increase in diversity has different implications for different racial groups, depending on their initial representation and the nature of change. Consider the two simple hypothetical scenarios in Table 1 for the Blau index, defined as $1 - \sum p_i^2$, where p_i is the proportion of the group that is in race i . In the first scenario, the workgroup experiences an increase in diversity between the two time points, but the increase means different things for different racial groups. For blacks and Hispanics it means a rearrangement of the distribution of the people across other categories (white and Asian) but no change in their own representation. For Asians, by contrast, it means a loss of people of their own race. In the second scenario there is again an increase in diversity, but the surviving team members have experienced a different path to increased diversity. The Asians have once more experienced loss of representation. But despite the increased diversity over all, both blacks and Hispanics have experienced an increased representation of their own race. The group level measures cannot capture changes in the central factor of interest to organizational demography, the opportunity for same-race contact.

One response to this problem is to use a "relational diversity" measure that captures the extent to which a person is of a different race from the other employees in the branch (Tsui, Egan

and O'Reilly 1992). For a given demographic characteristic, Tsui, Egan and O'Reilly (1992) define the measure as the square root of the mean Euclidean distance between the focal individual i and all other team members j :

$$\sqrt{\frac{\sum (S_i - S_j)^2}{n}}$$

Since racial categories are nominal, Tsui, Egan and O'Reilly (1992) treat distance as binary, such that $(S_i - S_j) = 1$ if two people are of different races and 0 if they are of the same race. This measure has the desirable property that varies within groups according to the race of the individual and responds in predictable ways to the level of same-race representation. Closer inspection of the relational diversity measure reveals, however, that in the case of race it is a non-linear transformation for the extent of same-race representation. For a focal employee, the measure reduces to the square root of the proportion of the branch employees who are of a different race. Since there do not appear to be any strong reasons for assuming that this variable should assume this non-linear functional form, I instead simply use a measure that is the proportion of the workgroup that is of the same race as the focal employee.

I control for a variety of individual and branch-level characteristics that might be related to turnover rates. For each individual, I include dummy variables for sex and race. The firm's personnel records classify employees into five racial categories: white, black, Hispanic, Asian and other. However, since there are so few employees in the "other" category, I have used a four-category race variable throughout by combining Asian and other. I also control for the year in which employees were hired and for (log) annual salary and scheduled hours worked. The latter two variables can vary from year to year. I experimented with controls for job category,

but these had no statistically significant impact on turnover rates, or on the effects of other variables.

At the branch level, the primary controls are for geographic location, average scheduled hours of branch employees, and branch size. The firm's branches are located in six different urban areas in different regions of the United States. For confidentiality reasons, the exact geographic locations cannot be disclosed. In presenting the results, I use labels denoting the general region in which they are located; in interpreting the data and results, however, one should keep in mind that the "regions" refer to urban areas. I also include dummy variables in the statistical models to control for geographic differences in baseline turnover rates. Branches also vary in the extent to which employees work part-time, so I control for the average number of scheduled hours. Branch size is measured in terms of the number of full-time equivalent employees. This was computed by weighting each employee according to how many hours they were scheduled to work relative to a full time schedule. If employees were scheduled to work 35 or more hours, this ratio was set to 1. Since branch size varies over time, I control for changes in branch size by first including a measure of branch size at the time of entry into the branch, and then computing a change score for each subsequent time point, which is the difference between the current branch size and the size at the time of entry. Because the effects of increases and decreases in branch size may not be symmetric, I use a spline specification and estimate separate coefficients for increases in branch size (current employment is higher than at the time of entry) and decreases (current employment is lower).

All demographic measures are based on full-time equivalent employees. This means, for example, that a white person who works half-time is counted as half of a white person. The

demographic measures should capture the opportunity for interaction with a fellow employee with a particular demographic characteristic. Lacking data on the actual work schedule of each employee, it seems appropriate to weight each co-worker by the probability of contact during any hour during a full work week.

Methods

I analyze turnover rates using continuous-time event-history methods, since information on the exact dates of entry and exit from the branches is available. To account for duration dependence in the turnover rate, I use a piecewise constant specification (Blossfeld and Rohwer 1995). The piecewise constant model is a flexible specification that allows the baseline hazard rate to vary between specified intervals. After some experimentation, I settled on time-pieces at 3, 6, 9, 12, 15 and 21 months. The estimates suggest that the turnover rate increases gradually over the first 15 months of employment and then stabilizes. To adjust for the fact that new employees are sampled from the same branches, I present robust standard errors that account for clustering by branch. (All models were also re-estimated using Cox proportional hazard rate models, which led to the same pattern of results.)

Results

Before turning to the individual-level analyses of turnover rates, I present some descriptive evidence on the extent of workplace racial segregation in the United States. Doing so serves two goals. First, since workplace racial segregation has received relatively little attention,

the descriptive data help to establish the phenomenon. Second, data from representative samples of firms puts the analyses from the firm studied here in a broader context.

The existing evidence on the extent of workplace racial segregation in the United States is sparse, but the available evidence suggests substantial segregation. Becker (1980) used data from the 1975 Equal Employment Opportunities Commission survey of private employers with more than 100 employees to compute measures of black-white workplace segregation. He found that the apparently low level of segregation at the national level concealed extensive heterogeneity across occupations in the degree of workplace segregation, with laborers and service occupations exhibiting high levels of segregation. For example, while whites made up 69 percent of laborers in the sample, the average black laborer in the sample worked in an establishment where only 42 percent of laborers were white. Using matched employer-employee data from 1990, Carrington and Troske (1998) estimated Gini coefficients of black-white interfirm segregation, which can range from zero (perfect integration) to one (perfect segregation). In a sample of manufacturing establishments, they found high levels of segregation at the national level (Gini coefficient=0.78) and more modest but still substantial segregation when computed within geographic areas (Gini coefficient = 0.60). Bayard et al. (1999), also using matched employer-employee data from the 1990 Census, found little segregation by industry or (broad) occupational category, but extensive segregation by establishment. Among black men, the average percentage black in the establishment was 27.1 percent, while for whites and Hispanics the corresponding percentages black were 4.7 and 4.5 percent, respectively. Black women were more highly segregated than men, with average 35 percent black in the

establishment versus less than 6 percent for whites and Hispanics. For both sexes, segregation was higher in firms with less than 50 employees than in large firms.

In Table 2, I present estimates of the extent of racial segregation across firms in four U.S. cities: Atlanta, Boston, Detroit and Los Angeles. The segregation indices are computed from data from the employer survey administered as part of the Multi-City Survey of Urban Inequality (MCSUI) (Holzer et al. 2000). The MCSUI employer sample consists of responses to a survey administered between June 1992 and May 1994 to approximately 3,200 employers in the four metropolitan areas. Properly weighted, the data from MCSUI provide a representative sample of employers in the four cities covered. Along with a wide range of questions concerning their hiring practices, respondents⁴ were asked to list the number of non-college employees in each of four racial categories: white, black, Hispanic and Asian. An advantage of the MCSUI employer data is therefore that it allows for the computation of the multi-racial segregation indices recently proposed by Reardon and Firebaugh (2002). Table 2 presents estimates of two different measures developed by Reardon and Firebaugh, namely multi-group measures of a) the generalized dissimilarity index, and b) the Theil information theory index, along with bootstrap estimates of the standard errors of each index.⁵ I pooled the data across the four cities studied in

⁴ The survey was administered to the individual at each establishment who was responsible for hiring for jobs that did not require a college education.

⁵ The generalized dissimilarity index gives the proportion of workers that would have to be reallocated to achieve an even representation across workplaces, relative to the proportion that would have to be reallocated if firms were perfectly segregated. Thus an index of 0.5 indicates that half as many workers need to be reallocated compared to a situation of perfect segregation. The Theil index can be interpreted as one minus the ratio of the average within-firm racial diversity to the diversity of the population as a whole. This measure equals one when there is no within-firm racial diversity despite diversity in the population.

MCSUI and computed segregation indexes for employers of different sizes, in addition to computing segregation measures across all employers.⁶

Consistent with prior evidence, the overall estimates from MCSUI suggest a moderate level of racial segregation across workplaces. Looking at the dissimilarity measure, which has the most intuitive interpretation, 44.7% of employees would have to be reallocated across employers in order to equalize racial representation across employers among non-college employees (relative to the proportion that would have to be reallocated if there were perfect segregation). Overall segregation appears more modest when measured by the Theil index, however, with an index value of 0.229. However, this modest overall level of segregation is in part due the concentration of employment in large firms. Evidence for this can be seen in the strong relationship between employer size and the degree of racial segregation. The estimates in Table 2 reveal that segregation is considerably higher among employees employed in smaller firms, and declines as firm size increases. Among small firms with less than 15 employees, the generalized dissimilarity index is 0.737 and the Theil index is 0.603, while the corresponding numbers for firms with more than 250 employees are 0.401 and 0.182, respectively. Since most large firms are composed of numerous, smaller work-units, this suggests that the overall measure of segregation may overestimate the extent to which different races come into contact with each other in their day-to-day work environment.

⁶ Indexes were also computed separately for each city, leading to results that were generally consistent with the pooled estimates in Table 2, in particular with respect to the decline in measured segregation with increases in firm size. The most notable difference was that firms in Detroit tended to have the highest levels of segregation and firms in Atlanta the lowest. Details are available on request.

Branch segregation

I turn now to consider the racial composition of the branches in the firm studied. Table 3 suggests that the average racial distribution of the branches within region corresponds well to the racial distribution of the local labor market. The data on branches in Table 3 represent the average representation of each race across branches within a region. Thus the average branch in the West Coast region is 43 percent white, 7 percent black, 14 percent Hispanic and 36 percent Asian. The second row within each region presents the racial distribution of the closest matching Census occupation, bank tellers, using county-level data from the 1990 census.⁷ (A county is included if a branch is located in that county.) In general, Table 3 suggests that this firm's racial distribution is fairly representative of its local labor market. There are slight differences within region, but they are not substantial and likely reflect aggregation issues and the uneven distribution of branches over counties.

The aggregate distribution of branch employees conceals segregation across branches, however. I show this in two ways. First, Table 4 presents the same segregation indices as calculated in Table 2, but now computed across branches within regions.⁸ The generalized dissimilarity indices range between 0.41 and 0.63, while the Theil index ranges between 0.24 and 0.38. Given that the average branch size in this data is approximately 12 employees, segregation levels are lower than the corresponding levels for firms with less than 15 employees in the MCSUI data. Nonetheless, with an overall dissimilarity index of 0.53, racial segregation within this firm is substantial. I also test for segregation by cross-tabulating race and branch

⁷ Almost 55 percent of the new hires are classified as tellers by the firm.

⁸ This analysis is based on the composition of the branches at the first time a sampled employee enters the branch. Each branch only appears once.

assignment (within region) and estimating log-linear models of the association between branch and race. The top panel of Table 5 lists the likelihood-ratio χ^2 statistics, by region, for the model of independence, which assumes no association between branch assignment and race. In five of the six regions, this hypothesis is decisively rejected. The racial composition of branches varies significantly within almost all regions.⁹

The bottom panel in Table 5 presents tests for whether the pattern of segregation has changed significantly over time. For this test, I created a three way table (within region), cross-tabulating employee race, branch assignment and two time points. The two time points are: 1) the first time the branch is observed in the data (due to the entry of a sampled employee) and 2) the last time the branch is observed in the data (either due to censoring or to the departure of the last sampled employee).¹⁰ The test for whether the pattern of segregation has changed significantly over time is whether there is a significant three-way association between race, branch, and time. The bottom panel in Table 5 therefore presents test statistics for the fit of a model with all two-way interactions. This model fits the data in all regions; in none of the regions can we reject the null hypothesis that the pattern of racial segregation across branches is constant over time.

Given the stability of the segregation pattern, it is interesting to note that the aggregate composition of the new hires in the sample does not map onto the composition of the existing

⁹ These data do not allow more detailed examination of the reasons for this segregation. It is possible, for example, that the branches match the segregation in their local labor markets, if those markets are measured at a more detailed level. In other words, segregation in the workplace may reflect the mapping of branches into segregated neighborhoods. However, Muow (2002) estimated, using MCSUI data, that only 10 percent of the observed racial segregation across firms was due to residential segregation.

¹⁰ The average elapsed time between the two time points is 2.7 years.

employees. Table 6 presents the racial distribution of new hires separately for each of the six regions studied. There is substantial heterogeneity across regions in hiring patterns: a cross-tabulation of region by race of new hire yields a highly significant Pearson χ^2 of 511, with 15 degrees of freedom. In three of the regions, the majority of hires are from one group, but in only one of these is the majority of new hires white. Two regions tend to hire from two of the four racial categories. In the West Coast branches, hires are predominantly white or Asian, while in the Northeast-Atlantic region most hires are either black or white. The most even racial distribution of hires is found in the Mid-Atlantic region, although the virtual absence of Hispanic hires is notable. However, the number of branches and hires in this region is small.

A comparison of Tables 3 and 6 shows that the racial profile of hiring does not match the racial profile of the average branch. Figure 2 graphs the difference between the percentage of new hires that are of a given race and the average representation of that race in the branches. In four of the six regions, whites are under-represented among new hires relative to their representation among existing firm employees in the region. Non-whites tend to constitute a larger proportion of new hires than would be expected on the basis of their representation in the branches. In principle, this skewed hiring pattern could lead to lower segregation levels. However, as the models in the bottom panel of Table 5 showed, the segregation pattern is stable over time. One way to reconcile these two findings would be to argue that while non-whites are over-represented in the pool of new hires, this will not lead to compositional change if they have higher baseline turnover rates. To examine this, Figure 3 graphs non-parametric estimates of the turnover rates of the four different racial categories without any statistical controls. With the exception of black employees, the point estimates for the unadjusted hazard rates are virtually

identical. Given the width of the confidence intervals, the hazard rate for blacks is in range of the other racial categories. Figure 3 therefore suggests that differential baseline turnover rates do not account for the persistence of segregation in the presence of skewed hiring patterns.

Branch composition at entry

As I have suggested, an alternative explanation of the persistence of segregation emphasizes compositional effects. To begin exploring this issue, I first consider what kinds of branches the different races are hired into. Figure 4 and Table 7 present information on the demographic landscape that greets new employees in these branches at the time of hire. I start by considering the number of employees (including the new hire) who are the same race as the newcomer at the time of entry. Figure 4 graphs the frequency distribution of this variable for the four different races identified in the data (by definition, the value of this variable cannot fall below one). The distribution for whites is strikingly different than for the other races. If a new employee is white, it is very unlikely that he or she will be the only white person working at the branch. Only two whites (out of a total of 667 white hires) join a branch and find themselves the only white employees. The distributions are substantially more skewed for the three other races. For example, 13.6 percent of blacks join branches and find themselves the only black employee. Similar proportions of Hispanics (11.2 percent) and Asians (13.9 percent) have the same experience.

The modal experience is not racial isolation at entry, however. Table 7 contains data on the extent of same-race representation that greeted new employees, broken down by region. According to the data in Table 7, when a new white employee joins a branch, the average

number of white employees (including herself) is 7.9; in other words, the new employee has close to 7 full-time equivalent white colleagues. Overall, a new white employee joins a branch where 72 percent of the employees are white. Only in the West Coast and Mid-Atlantic branches do new white employees encounter workplaces where less than two-thirds of the branch is white. It is very rare for white employees to encounter workplaces where less than one-third of the workplace is white; separate calculations show that less than 5 percent do so.

As would be expected given their representation among bank tellers as an occupation (Table 3), the average experience of non-whites upon entering a branch is to find their race in the minority. In only three (of eighteen possible) cases do non-whites on average find themselves entering a branch where their race is in the majority: Asians in the West Coast region are hired into branches with an average of 53 percent Asians; Hispanics in the South are hired into branches with an average of 69 percent Hispanics; and blacks in the Mid-Atlantic region join branches that are half black on average. In all other cases, non-whites enter branches where their own race is less than 40 percent. Yet the segregation across branches is apparent if we consider the fact that average same-race representation is generally higher than the corresponding representation of the race in the labor market (Table 3). Segregation is also apparent in the fact that, for example, in the South region, both white and Hispanic new hires tend to enter branches that dominated by their own race (68 percent and 69 percent, respectively).

Determinants of turnover

I now turn to consider the impact of branch racial composition, and demographic change, on turnover rates. Table 8 begins by presenting a set of baseline models of the effects of the control variables and different measures of racial composition. The first model includes only control variables. Several patterns stand out in this model. First, as suggested by Figure 3, there are no significant race differences in baseline turnover rates, even after controlling for other employee, job and branch characteristics.¹¹ Turnover rates decline with salary, and increase with the proportion that works full time. Change in branch size has asymmetric effects: net increases in branch size do not significantly impact turnover rates, but net declines do. In interpreting this coefficient, one must keep in mind that the spline variable measuring declines is strictly non-positive; as the branch declines in size and moves further from the size at the time of entry, this variable declines. Multiplying the negative coefficient estimate by the negative values of the variable means that the further the current branch size is below the size at the time of entry, the higher the turnover rate.

The remaining models in Table 8 investigate the impact of three different time-varying measures of racial composition: the percentage of employees who are the same race; the number of employees who are the same race; and, for comparison to previous research, the group-level

¹¹ Given the regional differences in racial composition present in the data, I tested for the presence of significant interaction effects between employee race and region. This generates a total of twenty interaction effects. The vast majority of these were not significant. The significant interactions corresponded to the few race-by-region combinations in Table 3 where there are six or less employees. The inclusion of these interaction effects did not have a substantive effect on the conclusions of the models presented below. Since their inclusion is not substantively motivated, and complicates presentation considerably, I have omitted them from the estimated models.

racial diversity, measured using the Blau index.¹² In all three cases, the estimates suggest that employees have lower turnover rates to the extent that they work in groups where their race is well represented. Based on the estimates in model 3, a fellow co-worker of the same race lowers the turnover rate by approximately four percent ($\exp(-0.039)=0.96$).¹³ To get a sense of the implications of this for the different races, consider the differences in the average percentage employees of the same race in Table 7. These estimates from model 2 imply that the group composition causes a 1.18 times higher turnover rate for the average black hire relative to the average white hire; the corresponding figures are 1.15 and 1.16 for Hispanics and Asians.¹⁴ These figures are arrived at by considering the average across all regions. In some regions, the aggregate racial differences are substantially larger due to the more extensive segregation of the branches.

The models in Table 8 consider the effects of contemporaneous racial diversity. However, the racial composition of the branches fluctuates over time in response to entry and exit by employees. Table 9 examines the effects of the departure and arrival of other employees on the focal employee's turnover rate, controlling for time-varying compositional effects and the control variables in Table 8. The measures are the number of (full-time equivalent) employees who leave or join the branch at the beginning of a spell, by race. An interesting pattern emerges

¹² With four racial categories, the Blau index ranges between zero and 0.75, with the maximum achieved when all races are equally represented.

¹³ I tested for token effects (Kanter 1977) by including a dummy variable for individuals who were the only representative of their race at the time of hire. Tokens, as defined in this way, did not have significantly different turnover rates.

¹⁴ The figures were calculated using the average percentage same race for new hires from Table 5, and the coefficient estimate from model 3 in Table 6. For the black/white comparison, for example, $\exp(.36*-.456)/\exp(.72*-.456) = 1.18$.

in these estimates. First, people are not equally sensitive to all departures. If a person of the same race leaves the branch (for employment elsewhere, or through a transfer to another part of the firm), the turnover rate of the focal employee increases. Departures by a person of a different race, on the other hand, have no impact on the turnover rate. Second, the estimates in the second model show that arrivals of new employees also have a differential impact on turnover, depending on the race of the new co-worker. Turnover rates increase if the new co-worker is of a different race than the focal employee, but the addition of a same-race co-worker has no effect. Finally, the third model in Table 9 tests for the presence of interactions of these two effects with race. There do not appear to be any significant differences: all racial categories respond in the same way to the departure of someone of their own race, and to the arrival of people of a different race.

These effects are not easy to interpret directly, given that the models also control for the contemporaneous racial composition. To better understand the implications of these estimates, keep in mind that all the covariates of interest are measured on a time varying basis. Compare two identical people in two otherwise identical branches, one of whom experiences a same-race departure at time t , and the other of whom does not. The model controls for the current (time t) percentage of employees who are the same race as the focal employee. If these two groups have the same percentage of employees of a given race at time t and only one of the groups has experienced a same-race turnover event, it must be the case that the group that has experienced the turnover event has experienced a decline in the percentage of that race. In short, we are comparing groups A and B in Figure 1. By a similar logic, the effect of different race arrivals reflect declines in same-race representation. This suggests that these effects reflect the impact of

decreases in same-race representation. By contrast, the events that imply *increases* in same-race representation – the departure of different-race co-workers and the arrival of same-race employees – do not have a significant effect on turnover rates. In short, the effects of increases and decreases are not symmetric.

The models in Table 9 reflect the effects of transitory events – specific arrivals to and departures from the branch. Over time, these events accumulate: the racial composition at any point in time after group founding is the product of differential entry and exit by the races. I explore the consequences of cumulative change in racial composition in Table 10. To identify the effects of cumulative change, I separate the time-varying contemporaneous racial composition into three components: 1) a time-invariant measure of the racial composition at the time of hire; 2) a time-varying measure that is the difference between the current and initial composition if and only if the current percentage same-race is lower than the initial percentage, and zero otherwise; and 3) a time-varying measure that is the difference between the current and initial composition if and only if the current percentage same-race is higher than the initial percentage, and zero otherwise. The latter two components amount to using a spline specification to separate the effects of cumulative changes that are negative from the effects of cumulative changes that are positive.

The estimates in Table 10 provide further evidence that the effects of changes in racial composition depend on the direction of change. Several things are worth noting. First, initial conditions matter: turnover rates are lower if people are hired into branches where they are well represented. The effects are of similar magnitude to the effect of contemporaneous composition in Table 8. Second, turnover increases in response to demographic change that causes the same-

race representation to fall below the level present at entry. For example, an employee who experiences a five percentage point cumulative decline in same-race representation has an expected turnover rate that is 1.08 times higher. Increases in same-race representation, on the other hand, do not have a significant relationship with the turnover rate. Finally, this pattern of effects is shared by all four racial groups. The last three models in Table 10 test for race interactions with the three components of change in racial composition; none of these models lead to significant improvements in fit.

The asymmetric effects of increases and decreases in same-race representation observed in Tables 9 and 10 are difficult to square with the standard theories of organizational demography. Both social-categorization and similarity/attraction arguments suggest that more same-race representation is better, and less is worse. This appears to be true as a statement about *levels* (witness the effect on same-race representation at the time of entry), but incorrect as a statement about *change*. When it comes to change in same-race representation and attachment, the results suggest that less is worse, but more is neither better nor worse.

This pattern is consistent with, but not demonstrative of, the notion that turnover occurs when the racial composition of the group falls below some threshold level (Schelling 1971). The threshold explanation is difficult to test. While individual thresholds presumably vary in a number of idiosyncratic ways, they likely also have a systematic component due to common contextual factors. For example, the racial composition of the local labor market may serve as a standard against which the racial composition of the workplace is compared. If the local labor market helps to define the threshold, then a crude way to test the threshold story is to see whether turnover rates increase once the representation of a race falls below its representation in

the local labor market. I present such a test in Table 11, using the Census data on the percentage of bank tellers of a given race in the county where a branch is located. The first model in Table 11 simply includes a dummy variable for whether the employee's race constitutes a smaller proportion of the branch than it does of the local labor market. The second model interacts this dummy variable with the negative cumulative change variable from Table 10. As is apparent, being below the threshold -- as defined in this crude way -- does not appear to have a significant effect on turnover. This does not rule out a threshold explanation, but does suggest that people are not simply comparing their branch to the local labor market average.

Discussion

This paper has used a unique data set to answer a simple empirical question: How do people respond to changes in the racial composition of their workplaces? As I have argued, understanding the dynamics of this change process is central to understanding the persistence of racial employment segregation. The central finding is that the effects of group racial composition on turnover are path dependent. Groups have demographic histories, and these histories have consequences for individuals. This path dependence is not anticipated by standard explanations in the literature on organizational demography. Social categorization theory and similarity/attraction or homophily theories imply that attachment should increase among workers who experience increases in same-race representation. This does not appear to be the case. Turnover does respond to declines in same-race representation, however, suggesting that employees are more sensitive to losses. Phrased more starkly, things can only get worse: changes in same-race representation can only lead to declines in attachment.

The sociological mechanisms generating this asymmetric pattern of path dependence are less clear, however. One concern is that since the estimates are based on data from a single firm, these results may be an idiosyncratic feature of the firm studied. Ultimately, the generality of these findings can only be established through further research. However, the recruitment and personnel policies of this firm appear representative of the practices of large U.S. corporations. The firm has a well-developed, formalized human resources function and has long been subject to the reporting requirements of the Equal Employment Opportunity Commission. One might suspect that a firm willing to share its personnel records would do so because it had undertaken particular initiatives (for example, relating to workplace integration) and wished to assess their performance. However, there were, to my knowledge, no specific initiatives undertaken by the firm during the study period designed to change the racial composition of the branches studied here. Moreover, I secured the personnel data through a broader initiative by the firm designed to allow a wide range of social science researchers relatively unfettered access to all of the company's operations.

The observed pattern of path dependence is consistent with the behavioral assumptions underlying threshold models of neighborhood segregation (Schelling 1971). The lack of evidence for the threshold account in Table 11 may reflect the crude nature of the test. It seems likely that thresholds vary across individuals, for a variety of reasons, such as previous inter-racial contact, personality traits and ideology. Ideally, one would measure attitudes about the racial composition of the workplace, much in the style of the tests of neighborhood preferences by Farley et al. (1994) and Clark (1991). This would be difficult, however, since one would ideally collect these measures prior to entry into the workplace, and then follow people forward

in time to measure their group attachment or turnover. Nonetheless, studies of neighborhood preferences suggest that people have preferences about “what kind of neighborhood” they want to live in, independent of any knowledge of the identities of the people living there. Future research should examine whether the same is true of workplaces.

A somewhat different explanation for the asymmetric effects of losses and gains in same-race representation can be derived from the psychology of decision-making. Voluntary turnover reflects a decision-making process where the employee assigns a value to the current job relative to an alternative. If we assume that the racial composition of the workplace affects the value assigned to the job (for example through the positive affect created by friendship with coworkers), then changes in composition can influence this valuation. Standard models of rational decision making would suggest that prospective losses and gains in value should weigh equally in decisions. However, robust empirical evidence suggests that decision-makers are much more sensitive to losses than to gains (Tversky and Kahneman 1991). Kahneman, Knetsch and Thaler (1990) found that the losses in utility associated with giving up a valued good outweighed the perceived benefits of receiving the same good. As in the case of tipping theories of segregation, loss aversion suggests that turnover will increase in response to declines in same-race representation, but be less sensitive to increases. This type of explanation is consistent with existing explanations of demographic effects such as similarity/attraction theory, in the sense that those theories need only be modified to specify a different functional relationship between changes in composition and attachment.

The apparent path dependence of the relationship between group racial composition and turnover has a number of substantive and methodological ramifications. Substantively, two

implications stand out. First, the empirical results suggest the presence of an imprinting effect whereby the level of same-race representation at the time of entry has a lasting and consequential impact on attachment. As a consequence, entry cohorts become a salient source of differentiation between group members. Research in organizational socialization (Wanous 1992) suggests that the period immediately following organizational entry plays a critical role in defining an employee's relationship to the organization and his or her co-workers. This may be particularly true for people who join workplaces where they are a racial minority. Kanter's (1977) work suggests that (numerical) minorities in demographically skewed groups come to occupy tightly circumscribed roles due to the behavioral and normative expectations of the majority group. The visibility of the token (or near-token) status increases the social pressure experienced by its occupants. The results presented here suggest that the problems encountered by tokens are not solved by simply increasing their representation in the group; people may continue to feel like tokens well after representation has improved. Subsequent hires from the under-represented group may lead to increases in that group's average attachment, but the mechanism behind this change is a cohort-replacement process, not an increase in the attachment of the tokens.

Second, the sensitivity of employees to declines in same-race representation point to a basic obstacle in trying to remedy workplace segregation through hiring. Moving from a workplace that is racially skewed to a more balanced workplace requires the addition of under-represented races. Imagine an employer who is pro-active and tries to change workplace composition by hiring members of the under-represented race, and consider two successive cohorts of employees of a given race in the group. (The cohorts may only consist of a single

employee each). Since the second cohort is hired subsequent to the first, it joins the group with a greater initial same-race representation and hence a lower expected turnover rate than the first cohort. If the members of the first cohort should leave, the turnover rate of the second cohort will increase because of the decline in same-race representation. Paradoxically, the expected turnover rate of the second cohort will in fact exceed the original expected turnover rate of the first cohort. This result derives from the fact that the magnitude of the coefficient for declines in same-race representation is substantially larger than the coefficient for the effect of initial same-race representation.¹⁵ This implies that gains in the representation of a single race can be very fragile.

The results of this study also have several implications for the design of future research. First, studies of the effects of group composition on turnover (and other individual and group outcomes) must examine the effects of demographic change explicitly and not rely on cross-sectional comparisons across groups. As exemplified by the hypothetical groups in Figure 1, groups with the same composition at a point in time may have very different dynamics because they have reached that point in different ways. The path dependent character of the effects of group composition means that the implicit Markov assumption of cross-sectional research must be rejected: past states are not irrelevant (Sørensen 2000). Models that rely only on cross-sectional comparisons will likely suffer from unobserved heterogeneity, because an individual's attachment to the group depends not only on the contemporaneous composition of the group but also on how the current make-up compares to the conditions at the time of organizational entry.

¹⁵ This observation is based on the coefficient estimates from the first model in Table 10. One should treat these estimates with caution since they derive from a case study of a single firm.

For students of racial employment segregation, an important methodological implication of this study is the need to study segregation processes at the workgroup level. This is true both in terms of attempts to understand the processes that generate segregation, and in terms of trying to estimate the degree of racial segregation. Many of the post-hire processes that generate differential turnover rates depend on the dynamics of social interaction in the workplace. In some cases, workplace interaction may primarily take place between people who share the same job title, but in the a large number of work environments people with different job titles interact on a regular basis. Workgroups are therefore in many cases a the most suitable unit of observation for studies of post-hire dynamics. Furthermore, attempts to measure the extent of racial employment segregation must be sensitive to the aggregation issues created by using employers or firms as the unit of analysis. The observed degree of racial employment segregation appears to attenuate as the size of the workplace increases, as evidenced by the figures in Table 2. However, large firms that appear to have relatively low levels of segregation at the firm level may exhibit more extreme segregation at the workgroup level within firms. Thus the racial composition of the firm studied in this papers appears at first glance to reflect the local labor market well, but closer inspection revealed substantial segregation across workplaces. Since large firms account for a large share of employment in the American labor market, firm-level segregation measures may underestimate the extent to which different races are segregated from each other in their daily work environments.

Conclusion

I have argued that racial employment segregation should be understood as the outcome of demographic processes within organizations, and that a richer understanding of the causes of racial segregation across workplaces can be achieved through attention to the post-hire processes that generate differential turnover rates. Almost four decades after the passage of legislation designed to end employment discrimination, the racial segregation of employment remains a persistent source of inequality in the American labor market. In trying to understand this phenomenon, labor market sociologists have focused primarily on the processes that match workers and jobs, in particular the actions taken by employers at the point of hire. This stream of research has shed great light on the subtle and indirect ways in which various hiring methods and criteria lead to unequal employment opportunities for different races. Yet a strong emphasis on the hiring process also has its costs, as it deflects attention from the impact of post-hire processes that generate turnover. The racial composition of a workplace at a particular moment is the outcome of a history of flows across the organizational boundary as workers of different races join and leave the organization at varying rates. Studies of hiring must therefore be complemented by studies of turnover, and these studies must be sensitive to the histories of demographic change in organizations.

A further consequence of the emphasis on hiring is to exaggerate the degree to which the demographic composition of the workplace is something that the employer decides about and is able to control. While racial employment segregation may to a certain extent be a consequence of organizational goals, even organizations that are explicitly committed to integration may encounter great difficulty in achieving racial balance (Stinchcombe, McDill and Walker 1968).

The parallels to the integration of schools are instructive, if not heartening. While policy makers have made substantial – if incomplete – progress in integrating public schools, the formal integration of schools often obscures a high degree of informal segregation of friendship networks within schools (Hallinan and Williams 1989; Moody 2001). The fact that differential turnover rates are a function of on-going social processes in the workplace complicates the task of achieving integration considerably. It suggests that there may be limits to the ability of employers to manage these processes, and that successful integration will require the development of new approaches to managing workplace dynamics.

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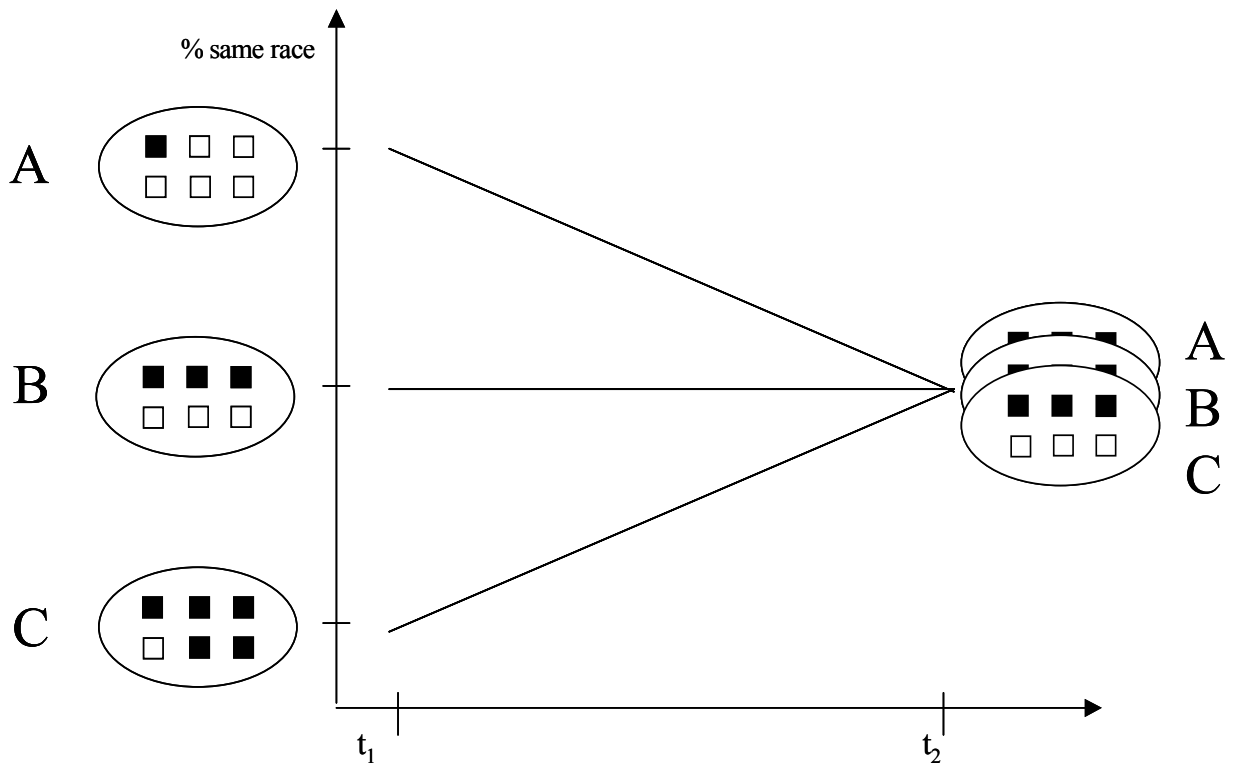


Figure 1 Hypothetical paths of change in group composition

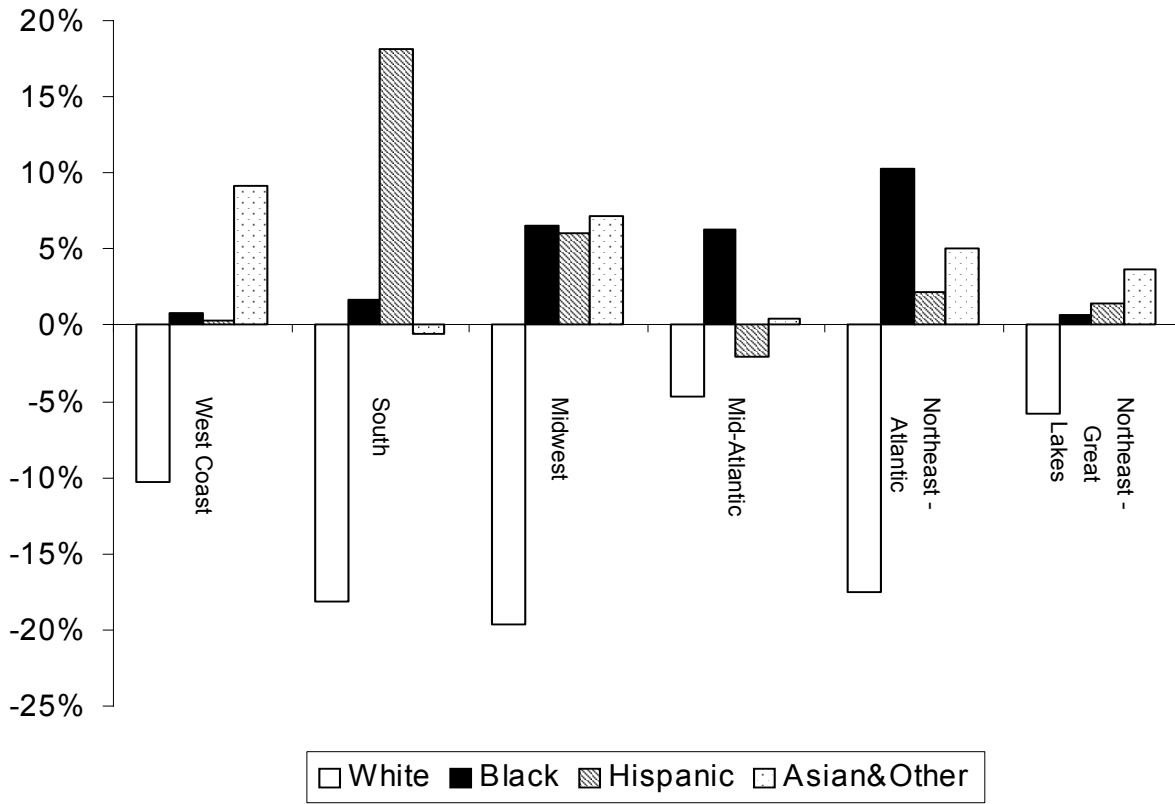


Figure 2 Difference between the representation of races among new hires and existing employees of the average branch, by region

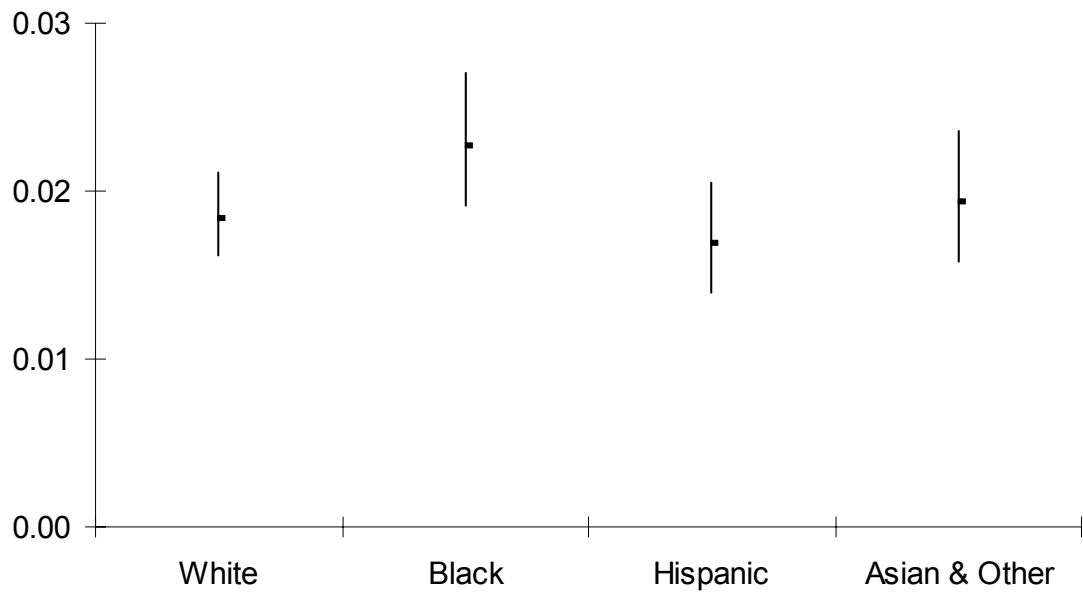


Figure 3 Non-parametric estimates of the hazard rate and 95% confidence intervals for turnover, by race

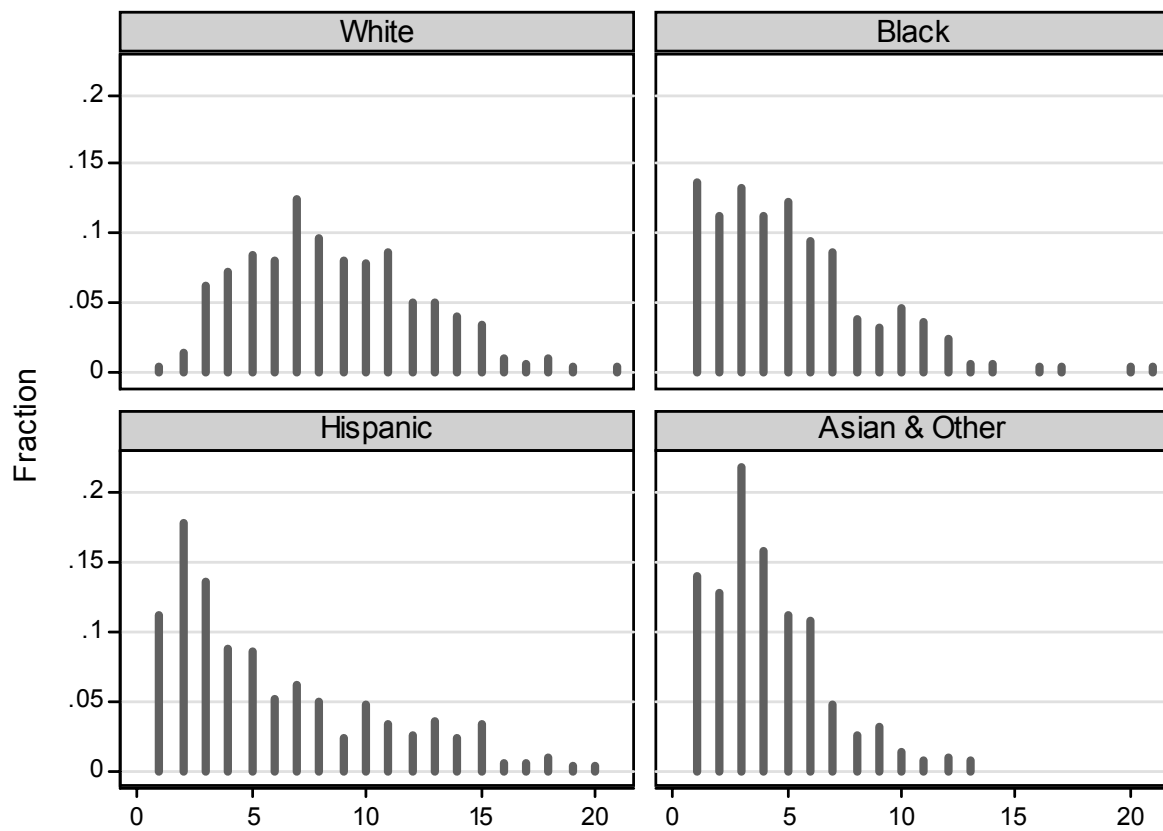


Figure 4 Number of same-race employees at time of hire, by race

Table 1: Hypothetical scenarios of group-level diversity measures and demographic change

	Time 1	Time 2
<i>Scenario 1</i>		
White	0	2
Black	2	2
Hispanic	2	2
Asian/Other	4	2
Total	8	8
Blau index ($1-\Sigma p_i^2$)	0.625	0.75
<i>Scenario 2</i>		
White	0	0
Black	2	3
Hispanic	2	3
Asian/Other	4	2
Total	8	8
Blau index ($1-\Sigma p_i^2$)	0.625	0.66

Table 2: Indexes of the racial segregation of non-college employees across firms in the Multi-City Study of Urban Inequality, by total firm employment

	Dissimilarity	Theil
< 15 employees (781 employers)	0.737 (0.018)	0.603 (0.023)
15-49 employees (709 employers)	0.647 (0.013)	0.477 (0.158)
50-99 employees (352 employers)	0.610 (0.016)	0.430 (0.017)
100-249 employees (456 employers)	0.568 (0.026)	0.378 (0.026)
250+ employees (401 employers)	0.401 (0.075)	0.182 (0.057)
Overall (2,699 employers)	0.447 (0.070)	0.229 (0.061)

Bootstrap standard errors are in parentheses, based on 500 replications. Both indexes have a theoretical maximum value of 1, indicating perfect segregation, and a theoretical minimum of 0, indicating no segregation. Indexes are computed according to Reardon and Firebaugh (2002).

Four races are identified in the data: whites, blacks, Hispanics and Asians. The data are pooled across the four cities studied in MCSUI (Atlanta, Boston, Detroit and Los Angeles) and weighted by the MCSUI sampling weights.

Table 3: Racial distributions of branches and local labor markets

		White	Black	Hispanic	Asian & Other	Total
West Coast	Branches	43%	7%	14%	36%	100%
	Labor market	48%	7%	19%	26%	100%
South	Branches	42%	12%	41%	4%	99%
	Labor market	47%	15%	36%	2%	100%
Midwest	Branches	72%	7%	15%	6%	100%
	Labor market	65%	18%	11%	6%	100%
Mid-Atlantic	Branches	33%	34%	8%	25%	100%
	Labor market	40%	36%	10%	14%	100%
Northeast - Atlantic	Branches	56%	20%	18%	6%	100%
	Labor market	51%	25%	16%	8%	100%
Northeast - Great Lakes	Branches	93%	5%	0%	2%	100%
	Labor market	85%	8%	4%	3%	100%

Note: The cell entries were computed as follows:

Branches: Average proportion of each race across branches, computed the first time a new hire entered the branch

Labor market: Average proportion of each race in Census occupation 383 ("Bank tellers") in the counties in which the branches are located. Data from the 1990 Census.

Table 4: Indices of the racial segregation of employees across branches, by region.

	Dissimilarity	Theil
West Coast (N = 59 branches)	0.423 (0.035)	0.252 (0.031)
South (N = 25 branches)	0.588 (0.048)	0.382 (0.049)
Midwest (N = 34 branches)	0.515 (0.046)	0.307 (0.048)
Mid-Atlantic (N = 11 branches)	0.412 (0.050)	0.237 (0.044)
Northeast-Atlantic (N = 121 branches)	0.503 (0.022)	0.307 (0.022)
Northeast-Great Lakes (N = 13 branches)	0.633 (0.114)	0.319 (0.061)
Overall (N = 263 branches)	0.534 (0.016)	0.363 (0.018)

Bootstrap standard errors are in parentheses, based on 500 replications. Both indexes have a theoretical maximum value of 1, indicating perfect segregation, and a theoretical minimum of 0, indicating no segregation. Indexes are computed according to Reardon and Firebaugh (2002).

Table 5: Log-linear models of racial segregation across branches, by region

A) Model of independence of race and branch at time 1 ([R][B])

	G^2	df
West Coast	313.4**	174
South	257.9**	72
Midwest	217.4**	99
Mid-Atlantic	62.9**	30
Northeast - Atlantic	1077.3**	360
Northeast - Great Lakes	19.2	36

B) Constant racial segregation over time ([BT][RT][BR])

	G^2	df
West Coast	141.6	174
South	50.7	72
Midwest	70.9	99
Mid-Atlantic	32.6	30
Northeast - Atlantic	247.6	360
Northeast - Great Lakes	12.5	36

Notes:

Models in Panel A are models of independence of race and branch on the first date a branch is observed in the data.

Models in Panel B are from a three-way table of race by branch by time, where the second time point is the last time a branch is observed in the data set.

R=Race, B=Branch, T=Time

** $p < 0.01$

Table 6: Race distribution of new hires, by region

	Race of new hire				Total	Branches
	White	Black	Hispanic	Asian & Other		
West Coast	126 33%	30 8%	55 14%	174 45%	385 100%	59
South	42 24%	24 14%	104 59%	6 3%	176 100%	25
Midwest	147 52%	38 14%	59 21%	37 13%	281 100%	34
Mid-Atlantic	19 28%	27 40%	4 6%	17 25%	67 100%	11
Northeast - Atlantic	272 38%	214 30%	143 20%	78 11%	707 100%	121
Northeast - Great Lakes	61 87%	4 6%	1 1%	4 6%	70 100%	13
Total	667 40%	337 20%	366 22%	316 19%	1686 100%	263

Table 7: Same-race representation at time of entry by new hires

		Race of new hire				<i>Mean branch size</i>
		White	Black	Hispanic	Asian & Other	
West Coast	<i>Mean N same race</i>	4.7	2.4	2.3	4.8	8.9
	<i>% same race</i>	55%	26%	27%	53%	
	<i>Isolates</i>	2	12	14	8	
	<i>N of hires</i>	126	30	55	174	
South	<i>Mean N same race</i>	6.9	4.1	9.8	1.8	12.5
	<i>% same race</i>	68%	34%	69%	19%	
	<i>Isolates</i>	0	3	4	3	
	<i>N of hires</i>	42	24	104	6	
Midwest	<i>Mean N same race</i>	9.4	3.0	4.4	2.6	12.1
	<i>% same race</i>	78%	25%	38%	21%	
	<i>Isolates</i>	0	8	10	12	
	<i>N of hires</i>	147	38	59	37	
Mid-Atlantic	<i>Mean N same race</i>	4.0	4.4	2.3	3.4	8.8
	<i>% same race</i>	50%	50%	24%	35%	
	<i>Isolates</i>	0	1	1	0	
	<i>N of hires</i>	19	27	4	17	
Northeast - Atlantic	<i>Mean N same race</i>	8.6	5.3	4.2	2.6	13.0
	<i>% same race</i>	74%	39%	30%	20%	
	<i>Isolates</i>	0	18	11	19	
	<i>N of hires</i>	272	214	143	78	
Northeast - Great Lakes	<i>Mean N same race</i>	9.7	0.8	1.0	1.3	10.6
	<i>% same race</i>	92%	11%	13%	11%	
	<i>Isolates</i>	0	4	1	2	
	<i>N of hires</i>	61	4	1	4	
Total	<i>Mean N same race</i>	7.9	4.6	5.5	3.8	11.6
	<i>% same race</i>	72%	36%	42%	39%	
	<i>Isolates</i>	2	46	41	44	
	<i>N of hires</i>	667	337	366	316	

Note: The rows contain the following information for each region:
Mean N same race: mean number of FTE employees of the same race as the new hire (including the new hire)
% same race: percentage of FTE employees of the same race as the new hire (including the new hire)
Isolates: number of new hires who are the only people of their race at entry
N: total number of new hires of that race

Table 8: Baseline piecewise-constant hazard rate models of the effects of branch racial composition on turnover

Variable	(1)	(2)	(3)	(4)
Tenure 0-3 months	-2.056 (2.103)	-1.581 (2.124)	-1.804 (2.114)	-2.120 (2.111)
Tenure 3-6 months	-1.272 (2.082)	-0.797 (2.104)	-1.020 (2.093)	-1.337 (2.088)
Tenure 6-9 months	-0.874 (2.082)	-0.399 (2.103)	-0.622 (2.092)	-0.940 (2.088)
Tenure 9-12 months	-0.622 (2.072)	-0.147 (2.093)	-0.370 (2.082)	-0.690 (2.077)
Tenure 12-15 months	-0.236 (2.081)	0.237 (2.102)	0.015 (2.091)	-0.305 (2.086)
Tenure 15-21 months	-0.698 (2.085)	-0.226 (2.107)	-0.450 (2.096)	-0.768 (2.090)
Tenure 21 + months	-0.360 (2.088)	0.108 (2.109)	-0.114 (2.099)	-0.435 (2.094)
Male	0.136 (0.094)	0.130 (0.095)	0.130 (0.095)	0.131 (0.094)
Black	0.230 (0.129)	0.096 (0.137)	0.100 (0.135)	0.153 (0.130)
Hispanic	-0.114 (0.139)	-0.245 (0.146)	-0.240 (0.145)	-0.179 (0.141)
Asian & other	-0.133 (0.143)	-0.240 (0.146)	-0.247 (0.147)	-0.170 (0.141)
South region	-0.739** (0.203)	-0.660** (0.199)	-0.659** (0.197)	-0.643** (0.202)
Midwest region	-0.449** (0.173)	-0.440* (0.172)	-0.444** (0.171)	-0.385* (0.180)
Mid-Atlantic region	-0.382 (0.267)	-0.374 (0.258)	-0.373 (0.259)	-0.393 (0.262)
Northeast - Atlantic	-0.329* (0.160)	-0.312 (0.159)	-0.321* (0.159)	-0.281 (0.162)
Northeast - Great Lakes	-0.748** (0.216)	-0.661** (0.224)	-0.667** (0.216)	-0.565* (0.242)

Table 8, cont.

Variable	(1)	(2)	(3)	(4)
Hired in 1997	0.248* (0.103)	0.250* (0.103)	0.247* (0.103)	0.250* (0.103)
Hired in 1998	0.018 (0.168)	0.012 (0.167)	0.010 (0.167)	0.004 (0.168)
Hired in 1999	-0.192 (0.725)	-0.189 (0.725)	-0.194 (0.724)	-0.224 (0.724)
Log annual salary	-0.516* (0.210)	-0.539* (0.211)	-0.542* (0.211)	-0.535* (0.209)
Scheduled hours	-0.008 (0.013)	-0.007 (0.013)	-0.007 (0.013)	-0.008 (0.013)
Branch mean scheduled hours	0.067* (0.026)	0.067* (0.026)	0.068** (0.026)	0.067* (0.026)
Branch size at time of hire (N_0)	-0.010 (0.017)	-0.010 (0.017)	0.009 (0.019)	-0.016 (0.017)
Negative net change in branch size since hire ($N_t - N_0$) if $N_t < N_0$	-0.110** (0.034)	-0.115** (0.034)	-0.095** (0.035)	-0.116** (0.035)
Positive net change in branch size since hire ($N_t - N_0$) if $N_t > N_0$	0.054 (0.030)	0.050 (0.030)	0.069* (0.031)	0.048 (0.030)
Percentage same race		-0.456* (0.183)		
Number of employees of same race			-0.039* (0.015)	
Racial diversity ($1 - \sum p_i^2$)				0.593* (0.259)
Log-likelihood	-1,213.5	-1,210.4	-1,210.2	-1,210.5

Note: Two-sided t-tests: * $p < .05$ ** $p < .01$

Table 9: Piecewise-constant hazard rate models of the effects of entry and exit by other employees on turnover

Variable	(1)	(2)	(3)
Black	0.113 (0.136)	0.112 (0.137)	0.069 (0.159)
Hispanic	-0.244 (0.145)	-0.237 (0.147)	-0.234 (0.166)
Asian & other	-0.226 (0.145)	-0.223 (0.146)	-0.209 (0.167)
Percentage same race	-0.592** (0.200)	-0.449* (0.210)	-0.485* (0.206)
Same race departures at start of spell	0.142** (0.046)	0.139** (0.049)	0.127* (0.063)
Different race departures at start of spell	0.001 (0.049)	-0.033 (0.056)	
Same race arrivals at start of spell		-0.070 (0.061)	0.083 (0.110)
Different race arrivals at start of spell		0.121* (0.056)	
Black * Same race departures			0.057 (0.133)
Hispanic * Same race departures			-0.064 (0.102)
Asian & other * Same race departures			0.006 (0.197)
Black * Different race arrivals			0.027 (0.130)
Hispanic * Different race arrivals			0.039 (0.135)
Asian & other * Different race arrivals			-0.020 (0.145)
Log-likelihood	-1,206.0	-1,203.2	-1,203.6

Note: All models include the full set of control variables included in the models in Table 8.
Two-sided t-tests: * p<.05 ** p<.01

Table 10: Piecewise-constant hazard rate models of the effects of cumulative changes in racial composition since entry on turnover

Variable	(1)	(2)	(3)	(4)
Black	0.121 (0.146)	0.218 (0.326)	0.069 (0.160)	0.183 (0.159)
Hispanic	-0.215 (0.155)	-0.079 (0.317)	-0.209 (0.161)	-0.160 (0.170)
Asian & other	-0.205 (0.150)	-0.057 (0.345)	-0.192 (0.163)	-0.313 (0.171)
Same race departures at start of spell	0.115* (0.048)	0.116* (0.049)	0.112* (0.049)	0.111* (0.049)
Different race arrivals at start of spell	0.097 (0.050)	0.097 (0.050)	0.095 (0.050)	0.096 (0.050)
Initial percentage of people of same race (P_0)	-0.454* (0.200)	-0.309 (0.370)	-0.466* (0.199)	-0.488* (0.203)
Negative net change in percentage same race ($P_t - P_0$) if $P_t < P_0$	-1.615* (0.700)	-1.611* (0.697)	-1.547 (0.807)	-1.602* (0.692)
Positive net change in percentage same race ($P_t - P_0$) if $P_t > P_0$	0.621 (0.921)	0.603 (0.923)	0.622 (0.919)	0.771 (1.489)
Black * P_0		-0.131 (0.536)		
Hispanic * P_0		-0.247 (0.545)		
Asian & other * P_0		-0.290 (0.622)		
Black * ($P_t - P_0$) if $P_t < P_0$			-1.254 (1.475)	
Hispanic * ($P_t - P_0$) if $P_t < P_0$			0.456 (1.789)	
Asian & other * ($P_t - P_0$) if $P_t < P_0$			0.569 (2.042)	
Black * ($P_t - P_0$) if $P_t > P_0$				-1.753 (2.037)
Hispanic * ($P_t - P_0$) if $P_t > P_0$				-1.728 (1.988)
Asian & other * ($P_t - P_0$) if $P_t > P_0$				1.595 (1.847)
Log-likelihood	-1,201.8	-1,201.6	-1,201.2	-1,198.9

Note: All models include the full set of control variables included in the models in Table 8.

Two-sided t-tests: * $p < .05$ ** $p < .01$

Table 11: Piecewise-constant hazard rate models of the effect of branch racial composition relative to the local labor market

Variable	(1)	(2)
Black	0.078 (0.150)	0.068 (0.148)
Hispanic	-0.269 (0.163)	-0.271 (0.162)
Asian & other	-0.266 (0.161)	-0.264 (0.159)
Same race departures at start of spell	0.119* (0.049)	0.117* (0.049)
Different race arrivals at start of spell	0.096 (0.050)	0.089 (0.051)
Initial percentage of people of same race (P_0)	-0.568* (0.227)	-0.572* (0.227)
Negative net change in percentage same race ($P_t - P_0$) if $P_t < P_0$	-1.832* (0.720)	-2.989** (1.116)
Positive net change in percentage same race ($P_t - P_0$) if $P_t > P_0$	0.494 (0.954)	0.725 (0.952)
Branch same-race percentage is below market percentage	-0.127 (0.122)	-0.028 (0.135)
Branch below * ($P_t - P_0$) if $P_t < P_0$		1.733 (1.199)
Log-likelihood	-1,201.1	-1,200.0

Note: All models include the full set of control variables included in the models in Table 8.
Two-sided t-tests: * $p < .05$ ** $p < .01$