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BEYOND SIMPLE DEMOGRAPHIC EFFECTS: THE IMPORTANCE OF RELATIONAL DEMOGRAPHY IN SUPERIOR-SUBORDINATE DYADS

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Previous research on individual demographic characteristics has typically examined only direct effects on outcomes such as work attitudes and behavior. This investigation examined the multivariate effects of six demographic variables—age, gender, race, education, and company and job tenure—on superiors' ratings of performance and liking for subordinates and subordinates' role ambiguity and conflict. A field study of 272 superior-subordinate dyads produced results that support the notion that increasing dissimilarity in superior-subordinate demographic characteristics, referred to here as "relational demography," is associated with lower effectiveness as perceived by superiors, less personal attraction on the part of superiors for subordinates, and increased role ambiguity experienced by subordinates. These effects were found even after we controlled for the effects of simple demographic variables.

Demographic characteristics of individuals like age, gender, race, tenure, and education have long been considered important variables in psychological research (e.g., Zedeck & Cascio, 1984). For example, recent investigations have examined the effects of individuals' demographic attributes on outcomes such as performance, satisfaction, turnover, selection, and leadership (Blau, 1985; Parsons & Liden, 1984; Steckler & Rosenthal, 1985). This stream of research has documented results indicating that often demographic variables are significantly associated with characteristic perceptions, attitudes, or work outcomes. For instance, in a meta-analysis of age differences in job performance, Waldman and Avolio (1986) documented a pattern of decreases in performance at higher ages when performance was measured by supervisory ratings. Duchon, Green, and Taber (1986) found gender to reliably predict outgroup status in a leadership study. A large number of investigations have explored other demographic effects, including the effect of race on selection decisions (McIntire, Moberg, & Posner, 1980), tenure on turnover (Mitchel, 1981), and seniority on job performance (Gordon & Fitzgibbons, 1982). The modal study in this tradition examines the independent effects of one or more relevant demographic attributes on outcomes at the individual level. But does that approach adequately capture the full impact of potential demographic effects?

Viewing organizations as composed of multiple sets of relationships suggests that "the distributional properties of the demography of the organization . . . are . . . critical in understanding demographic effects in organizations. Therefore, it is important to employ methodologies that enable the researcher to capture the properties of the distribution" (Pfeffer, 1982: 278). For instance, the age of an individual may be related to performance or turnover (Cleveland & Landy, 1981; Mobley, Griffeth, Hand, & Meglino, 1979; Waldman & Avolio, 1986), but this says nothing about possible compositional effects of age distribution in the individual's social group. Previous research has found that being older or having longer tenure than the members of some immediate referent group is inversely related to propensity to leave, regardless of the absolute value of the relevant demographic variable (Rhodes, 1983). McCain, O'Reilly, and Pfeffer (1983) also showed that being older in a group dominated by younger members led to an increased propensity to leave among older workers. Wagner, Pfeffer, and O'Reilly (1984) found that within top management teams it was the relative difference in ages within groups that predicted individuals' leaving, not the individuals' ages per se.

The concept of organizational demography in the existing literature refers to the composition of a group in terms of the distribution of basic attributes such as age, gender, tenure, race, education, and so on among potential noninteracting members (Pfeffer, 1983). In this article, we use the term relational demography to refer to the comparative demographic characteristics of members of dyads or groups who are in a position to engage in regular interactions. In other words, we propose that knowing the comparative similarity or dissimilarity in given demographic attributes of a superior and a subordinate or of the members of an interacting work team may provide additional information about the members' characteristic attitudes and behaviors and, more important, insight into the processes through which demography affects job outcomes. So, what are the mechanisms through which relational demography may affect outcomes such as job attitudes, turnover, and performance? It appears that the cause of relational demographic effects may be a combination of a high level of attraction based on similarity in attitudes, values, and experiences (Byrne, 1971; Byrne, Clore, & Smeaton, 1986) and strong communication among the interacting members of a team or dyad (Roberts & O'Reilly, 1979). Byrne (1969, 1971) described the relationship between attraction and similarity as the similarity-attraction paradigm.

CONCEPTUAL BACKGROUND

Demography and Similarity-Attraction

There has been a voluminous amount of research on the similarity-attraction paradigm (Berscheid & Walster, 1969; Byrne, 1971; Harrison, 1976). That research provided substantial evidence, across diverse populations, on the strong association between similarity and interpersonal attrac-

tion. Although early research focused on attitudinal similarity, more recent research has shown that similarity on any number of dimensions may increase attraction (Baskett, 1973). For instance, Werner and Parmelee showed that similarity in pastime preferences can predict friendship and attraction. They noted that shared activities are "especially important in initial stages" (1979: 65) of friendship development. More recent research has also shown that dissimilarity can lead to repulsion (Rosenbaum, 1986), with differences between people increasing the distance between them and lowering interpersonal attraction and liking. In other words, people tend to be drawn to those who are similar to them in terms of demographic characteristics, activities, or attitudes (Byrne, Clore, & Worchel, 1966).

In addition to interpersonal attraction, similarity has also been found to have a positive effect on communication and integration in social groups. For example, Lincoln and Miller (1979) analyzed the effects of gender, race, and education on work and friendship ties. They found that increased demographic similarity affected frequency of communication. Race and gender were positively related to number of friendship ties, and education was associated with increased work contacts. More recently, Zenger and Lawrence (1989) found age and tenure similarity to be positively associated with the frequency of technical communication in project teams. O'Reilly, Caldwell, and Barnett (1989) found that increased distance in tenure within work groups lowered social integration, which was in turn associated with higher turnover.

Thus, conceptually it appears that relational demography can affect work perceptions and attitudes through both interpersonal attraction and the frequency of interactions. These effects are postulated to account for variance above and beyond that accounted for by simple demographics. Although seldom investigated in organizational settings, the effects of relational demography have been documented in marriage practices (Guttentag & Secord, 1983), public attitudes (Glenn, 1969), crime rates (Maxim, 1985), and mobility patterns (Stewman & Konda, 1983). With the exception of research on vertical dyad linkage (Graen, 1976; Liden & Graen, 1980), scholars have paid little attention to relational demography at the dyadic level. Furthermore, although there exists substantial research evidence demonstrating the importance of individual-level demographic variables such as age (Giniger, Dispenzieri, & Eisenberg, 1983; Waldman & Avolio, 1986), tenure (Gordon & Fitzgibbons, 1982; Mitchel, 1981), race (Kraiger & Ford, 1985; Moch, 1980), gender (Terborg, 1977; Tsui & Gutek, 1984), and education (O'Reilly, Parlette, & Bloom, 1980), researchers have typically not investigated how variations in multiple demographic variables, in either their simple or relational forms, affect outcomes like attitudes or work performance. Most demography studies tend to focus on age or date of entry as the primary demographic variable affecting turnover. However, social comparison processes are clearly not limited to age alone. Individuals vary on multiple demographic characteristics. Analyses of demographic effects must consider the full impact of an individual's demographic profile rather than only one

or two demographic characteristics. As Landy and Farr (1983) observed, research on rater and ratee characteristics has usually examined either one characteristic—often age—or two characteristics (usually race and gender). Those authors considered findings in this stream of research to be piecemeal and equivocal and appealed for more research examining "constellations of variables that seem likely to influence performance judgments" (Huber, Neale, & Northcraft, 1987: 154). The current study investigated the simultaneous impact of six demographic variables.

Relational Demography in Superior-Subordinate Dyads

Of outcomes that may be functions of demographic characteristics in superior-subordinate dyads, performance judgment has been the most frequently studied (Kraiger & Ford, 1985; Mobley, 1982; Pulakos & Wexley, 1983). Consistent with the similarity-attraction paradigm, affect or liking would also be a natural outcome of similarity in demographic backgrounds between members of a dyad. Less studied but potentially important outcomes that relational demography in superior-subordinate dyads may affect are the role ambiguity and role conflict experienced by subordinates. If dissimilarity in demographic characteristics leads to low communication between the members of a dyad, role ambiguity should also be high. If dissimilarity in demographic background leads to differences in attitudes, values, and beliefs, role conflict should also be high because the dyad members may have different conceptions of the subordinate's role requirements. Though the effects of demographic differences on role ambiguity and conflict may be observed with referents other than an organizational superior, we suspect the effects will be most salient in superior-subordinate dyads because superiors are the primary referent for defining performance expectations and standards for subordinates. Other outcomes may be important for other referent group members. For example, liking may be a meaningful outcome for a peer-peer dyad. This study focused on superior-subordinate dyads and examined the effect of relational demography on four outcomes: (1) the performance of the subordinates as rated by the superiors, (2) the superiors' liking for the subordinates, (3) role ambiguity as experienced by the subordinates, and (4) role conflict as experienced by the subordinates.

A general hypothesis and four corollaries were explored. The general hypothesis concentrates on the overall effects of the multiple demographic variables on each of the four outcome measures. We developed the four corollary hypotheses to specify the relationship of each relational demographic variable to the outcome measures.

> *Hypothesis 1: The greater the dissimilarity in demographic background between a superior and a subordinate, the more negative will be such job outcomes as performance, affect expressed by the superior toward the subordinate, and role ambiguity and conflict as experienced by the subordinate.*

This is a directional hypothesis in that we expected differences in the rela-

tional demographic variables to be associated with unfavorable performance and affect ratings and with high role ambiguity and conflict scores. We further specified the expected effects of each relational demographic variable on the outcomes as follows:

> *Hypothesis 1a: Differences in race and gender in a superior-subordinate dyad will be negatively associated with both the superior's performance ratings of the subordinate and affect toward the subordinate.*

Research evidence to date has shown consistent though weak support for same-race (Kraiger & Ford, 1985) and same-gender (Mobley, 1982) bias on performance ratings, in that ratees were generally rated more favorably by raters of the same race or same gender. On the basis of the similarity-attraction paradigm, we expected to observe the effect of these two relational demographic variables to be larger on a superior's affective feeling toward a subordinate than on the performance rating. This expectation is also consistent with a finding of Lincoln and Miller's (1979). In their study, race and gender were related to number of friendship ties but not to work contacts.

> *Hypothesis 1b: Differences in age in a superior-subordinate dyad will be positively associated with the role ambiguity experienced by the subordinate and negatively associated with the superior's performance ratings of the subordinate.*

This hypothesis is derived in part from the decremental theory of aging (Giniger et al., 1983) and in part from recent research on age similarity and frequency of technical communications (Zenger & Lawrence, 1989). To the extent that a large difference in age reduces task-oriented communication, subordinates will have less clarity in performance goals and performance strategies. Whether true performance or bias is responsible, we expected superiors, especially younger superiors, to give lower performance ratings to subordinates older than themselves.

> *Hypothesis 1c: Differences in education in a superior-subordinate dyad will be positively associated with the role ambiguity and role conflict experienced by the subordinate and negatively associated with the superior's affect toward the subordinate.*

When members of a dyad differ on educational level, they also tend to vary on beliefs and values and may communicate relatively infrequently, since they do not have the "language compatibility" (March & Simon, 1958: 167) that is associated with similar levels of educational attainment. Thus, the superior and the subordinate may come to have different conceptions of the subordinate's job requirements, resulting in higher role ambiguity and role conflict for the subordinate. Such a difference in job expectations, coupled with the prestige associated with education (at least as perceived by the subordinate), may widen both the cognitive and the emotional distance between the superior and the subordinate.

> *Hypothesis 1d: Differences in job tenure between mem-*

bers of a superior-subordinate dyad will be positively associated with the role ambiguity experienced by the subordinate.

The amount of time each member of a dyad has held their job may influence role ambiguity. A new subordinate is likely to experience a higher level of role ambiguity than an experienced subordinate. Obversely, a subordinate who has been in a job for some time but who gets a new superior may also experience some role ambiguity. Clearly, role ambiguity should be highest when both members are new in their jobs. We postulated that differences in job tenure would have a significant incremental effect on role ambiguity, even after the length of tenure of each member of the dyad was controlled for.

Finally, we included company tenure in our analysis because it is an important variable for predicting turnover and an integral variable for describing the demographic profile of any organizational member. We considered job tenure to be more meaningful than company tenure in predicting these specific outcomes at the level of superior-subordinate dyads.

METHODS

Sample

The sample was a group of middle managers and their superiors. The population was 3,000 middle-level managers in a *Fortune* 500 multidivisional corporation. These managers occupied positions ranging from that of section manager to that of vice president. In order to obtain enough managers who were women or members of minorities to test the gender and race effects, we increased the sampling ratio of those two variables. Therefore, the initial random sample included 10 percent of the white men, 50 percent of the white women, and 50 percent of the minority managers in the corporation. This process yielded 558 managers. A total of 344 managers actually participated in the study, representing a response rate of 61.6 percent. We also obtained the participation of 272 superiors of these 344 managers. Thus, the effective response rate for this study was 49 percent.

The representativeness of this sample was verified by comparing the average age, education level, company tenure, and official performance ratings of the 344 managers with the average values of these variables for the middle-management population in the company. Analysis showed that the profile of the 344 managers based on these four variables was highly similar to that of the firm's middle management population. Thus, the sample of managers for this study appeared to be representative, with the exception of race and gender, of this company's middle managers.

Following Dansereau, Alutto, and Yammarino (1984), we studied dyads composed of a superior and a subordinate. Data were obtained from each manager and his or her superior (Graen, 1976). Thus, the analysis was explicitly at the level of superior-subordinate dyads, not superior-subordinate groups, although we assessed the dependent variables at the individual

level. A total of 272 superior-subordinate dyads were available. To check for representativeness, we compared this sample to the group of 72 managers for whom data on superiors were not available. Comparisons were made on three demographic variables—the managers' age, company tenure, and education—and on the official performance ratings the superiors had given the managers. No significant differences were found on any of these variables.

Procedures

Potential respondents were introduced to the research by a letter from the corporation's vice president for personnel. Within a week of their receiving this letter, we sent a package of survey instruments to each manager. We asked the subordinate managers to complete a survey and to give a different survey to their superiors for completion. The managers were told that the research sought to identify superiors' role expectations for their subordinate managers and the factors associated with managerial success. Both the subordinate managers and their superiors returned the completed surveys directly to us via a self-addressed, stamped envelope. Thus, though the subordinates saw the content of the superiors' survey, they did not see their superior's actual responses. The two surveys also contained questions on managerial roles and activities that were part of a larger study on managerial effectiveness.

Measures

Independent variables. Measures on the six demographic variables (age, gender, education, race, company tenure, and job tenure) were taken on both the subordinates and the superiors. Age was measured in years. Gender was coded with 1 designating men and 2 designating women. Education was measured by nine levels, with larger values corresponding to higher levels of educational attainment. Race was coded with 1 designating white and 2 designating nonwhite. A review of the research literature on race effects revealed that almost all of them have focused on black-white differences; nine of ten race studies we reviewed analyzed black workers, and one focused on Chicanos in New Mexico. This trend among previous studies suggested that analyses of race effects should avoid mixed racial groups, so for clearer interpretation of any potential race effect that might be observed in this study, we decided to exclude the race variable of minority-group subordinates who were not black. There were 49 nonwhite subordinates, of whom 20 were Asian or Spanish surnamed rather than black. We included these 20 subordinates in the analyses of the other five demographic variables. There were 10 black superiors and no superior who was a nonblack minority member.

The relational demographic scores were created by squaring the difference between the values for the demographic variables of the subordinates and their superiors. This distance measure is a dyadic analog to the *D*-score previous research has used to measure demographic distance in groups

(Wagner et al., 1984).[1] The squared term is used to derive an absolute difference score and to postulate an exponential function between the distance score and the outcome variable (Winkler & Hays, 1975). We obtained continuous difference scores on age, education, job tenure, and company tenure. For example, a difference score of 0 on the age variable meant that a subordinate and a superior were identical in age. A difference score of 1 meant that they differed by one year, and a difference of 4 meant that they differed by two years (in either direction). We obtained dichotomous difference scores on the gender and race variables, with 0 indicating that the subordinate and superior were of the same race or gender and 1 indicating that they were of different races or genders.

Dependent variables. Four outcome variables were measured. Two were obtained from the superiors' surveys: the performance effectiveness of a subordinate according to his or her superior's private opinion, and the superior's liking for the subordinate. We hereafter refer to these two variables as reputational effectiveness and supervisory affect, respectively. Reputational effectiveness is a three-item scale (Tsui, 1984) with high internal consistency ($\alpha = .90$) measuring the extent to which a subordinate had met the expectations of a superior in terms of roles and responsibilities.

Supervisory affect is also a three-item scale (Tsui & Gutek, 1984) with acceptable internal consistency ($\alpha = .69$). It was adopted from the interpersonal affect measure used by Kahn, Wolfe, Quinn, Snoek, and Rosenthal (1964), which measures the degree to which a rater likes a ratee, with high scores connoting a high degree of liking. The components of liking in this measure include enjoying working with a ratee, respecting the ratee's judgment, and believing that the ratee will extend help whenever the rater asks.

Rizzo, House, and Lirtzman (1970) developed the eight-item role conflict and six-item role ambiguity measures we used; Schuler, Aldag, and Brief (1977) subsequently revalidated them. We took the wording for the 14 items directly from the latter. The subordinates completed the role conflict ($\alpha = .85$) and role ambiguity ($\alpha = .84$) items.

Control variable. In order to examine the impact of demography on superiors' private evaluations of subordinates' effectiveness, independent of the subordinates' official performance level, we used the most recent official performance rating as a control variable. In the corporation studied, this

[1] Wagner, Pfeffer, and O'Reilly (1984: 80–81) defined the distance measure as a measure of isolation. It is an individual-level variable that transforms a demographic variable, such as a birth date or date of entry to the firm, into a metric that captures degree of membership in a cohort. One way to define this metric is the distance between any two individuals in terms of the Euclidian distance between each of them and every other person in the population of interest. A high score represents a weak connection to the group. This measure is a network analogue for representing social similarity. We have adopted this distance (D) score to measure social similarity in a two-person group, or a dyad. It is therefore directly analogous to the distance score that Wagner and colleagues employed to index an individual's similarity to all other individuals in a group.

rating is a one-item, 9-point scale, and is a summary measure of overall performance in achieving results-oriented objectives and effectiveness on 12 behavioral dimensions.

For this study's performance measure, we chose to use reputational effectiveness, the rating superiors made for this research, instead of the official rating for several reasons. First, the research rating is a three-item scale with high internal consistency reliability, and the reliability of the single-item official rating is unknown. Second, the research rating has proportionally larger variance than the official rating; the former has a standard deviation of 1.07 on a 7-point scale, and the latter, 1.15 on a 9-point scale. The coefficient of variation (s.d./x) for the research rating is 22 percent greater than the coefficient of variation for the official rating. Previous research (Wherry & Bartlett, 1982) has demonstrated that private performance ratings obtained for research purposes have better validity and reliability than official performance ratings obtained for administrative purposes. An assumption in our analysis was that factors other than ratee performance may bias official ratings. The residual from the partialing procedure used measured a supervisor's private opinion about a subordinate's performance, independent of the official rating. The private rating is a more meaningful measure for the assessment of demographic effects. Since nonperformance factors may also contaminate private ratings, we deliberately refer to the variable used as reputation or reputational effectiveness rather than as performance.

Analysis

Multiple regression analysis was used to estimate the effects of the demographic variables on the four outcome measures. Independent variables include superiors' and subordinates' simple demographic attributes and their relational forms (the squared differences between a subordinate's and superior's demographic measures). We developed separate regression models for each of the four outcome variables. The model for reputational effectiveness and for supervisory affect also included, as a control variable, the subordinate's most recent official performance rating.

Unique variance contributed to the outcome measures by each of the three sets of demographic variables and by the official performance rating was estimated by blocked regressions (Cohen & Cohen, 1975). This procedure controls for intercorrelations among independent variables by partialing out shared variance and measuring the unique contribution of the block of variables entered into the regression after all other independent variables have been entered. If inclusion of a block of independent variables significantly increases the overall amount of variance explained, that block of variables is deemed to have made an independent contribution to the variance explained in the dependent measure beyond that explained in earlier blocks. Since we were interested in the independent contribution of the set of relational demographic variables to variance in the four outcome measures, after controlling for the effects of simple demographic characteristics

of both the superiors and the subordinates, we considered this procedure appropriate. Other researchers have used it for similar purposes (e.g., Huber et al., 1987). We used this blocked regression procedure to estimate the unique contribution made by each set of demographic variables (the subordinates' demographics, the superiors' demographics, and the relational demographics) on each of the four outcome measures, controlling for the effects of the other two sets of demographic variables.

Since a specific direction in effect was predicted for the relational demographic variables, we used one-tailed tests of significance for these variables. Two-tailed significance tests were used for all simple demographic variables. Negative signs on the regression weights associated with the relational demography variables for supervisory affect and reputational effectiveness and positive signs on the regression weights associated with role ambiguity and role conflict would indicate results consistent with the hypotheses.

Additional analyses were performed to further explore the specific nature of the effects for relational demographic variables with significant regression weights on the outcome measures and especially for unexpected findings. For example, we performed two-way ANOVAs on the significant relational race and gender effects. One-way ANOVAs were performed on the continuous measures by trichotomizing the sample into three groups. If age difference was significant, for instance, we compared the mean ratings on the outcome variable for subordinates who were younger, the same age, and older than their superiors to isolate the specific nature of the differences. The ANOVA analyses on the reputational effectiveness and affect variables were performed with the official rating as a covariate. Finally, we conducted special analyses to check for any multicollinearity problem among the independent variables, using procedures described by Green (1978: 226–228).

RESULTS

Table 1 summarizes the descriptive statistics for the demographic variables. In general, compared to the subordinates, the superiors were slightly older, and they were predominantly men (94%). Three percent of the superiors were black. Superiors had slightly higher educational levels and longer company and job tenures. Table 1 also shows proportions of dyads with identical and different demographic measures.

Table 2 presents the intercorrelations among all the variables. The official performance rating is correlated with both reputational effectiveness and affect rating but not with the two role stress variables. The correlation between the official rating and the reputational effectiveness rating is only .46, showing a divergence between public and private opinions and providing some support for the argument that the two measures are not redundant. The correlation between reputational effectiveness and affect is .70, suggesting that supervisors' private judgments of subordinates' effectiveness are associated with their affect toward the subordinates (Latham & Wexley,

TABLE 1
Sample Demographics[a]

Demographic Variables	Subordinates	Superiors	Relational Demographics	
			Same	Different
Mean age in years	41.5	44.1	14	256
	(8.2)	(7.5)	(5%)	(95%)
Gender				
Men	256 (74%)	261 (96%)	197	74
Women	88 (26%)	10 (4%)	(73%)	(27%)
Race				
White	295 (91%)	258 (97%)	233	20
Black	29 (9%)	7 (3%)	(92%)	(8%)
Education				
Less than high school	23 (7%)	8 (3%)	61	210
High school	33 (10%)	11 (4%)	(23%)	(77%)
Some college	20 (6%)	10 (4%)		
Technical degree	44 (13%)	34 (12%)		
Bachelor's degree	110 (32%)	94 (35%)		
Some graduate courses	49 (14%)	55 (20%)		
Master's degree	56 (16%)	52 (19%)		
Postmaster courses	2 (1%)	4 (2%)		
Doctoral degree	6 (2%)	4 (2%)		
Mean job tenure in years	2.9	3.6	62	182
	(2.9)	(4.1)	(25%)	(75%)
Mean company tenure in years	10.3	13.0	31	234
	(6.5)	(7.3)	(12%)	(88%)

[a] There were 344 subordinates and 272 superiors studied. Some values do not add to 344 or 272 because of missing data. Standard deviations are reported in parentheses for the mean values of measures. Except for the means and percentages in parentheses, values reported are *N*'s.

1979; Tsui & Barry, 1986). Though these two measures are empirically correlated, we do not know whether they are conceptually redundant. For the purpose of this study, we decided to treat them as separate since we had postulated that some demographic variables would be differentially related to the two measures.

The intercorrelations among the six demographic variables for each member of the dyad were next examined. In most cases, the variables are not correlated. The largest correlation is between age and job tenure, for both the subordinates ($r = .42$) and the superiors ($r = .45$). The intercorrelations among the six relational demographic variables are also extremely small and largely nonsignificant. The correlations between the subordinates' and the superiors' simple demographic variables are also either nonsignificant or very small. Next, we examined the correlations between the simple demographic variables and their relational forms. Most of the correlations are small (med. $= -.01$); only 3 of the 72 correlations (12 simple $\times$ 6 relational demographic variables) are greater than .70. Using Green's procedures (1978:

TABLE 2
Intercorrelations[a]

			Dependent and Control Variables					Subordinates' Demographics						Superiors' Demographics						Relational Demographic Variables				
	Means	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Superiors' ratings																								
1. Reputational effectiveness	5.03	1.07																						
2. Affect for subordinate	4.13	0.59	70																					
Subordinates' ratings																								
3. Role ambiguity	3.20	1.06	−24	−15																				
4. Role conflict	3.99	1.09	−14	−11	46																			
Control variable																								
5. Official performance rating	6.60	1.15	46	32	−07	02																		
Subordinates' demographics																								
6. Age	41.54	8.21	−06	−00	−18	−17	−04																	
7. Gender	1.26	0.44	09	03	−01	−15	01	−27																
8. Race	1.09	0.29	−20	−21	07	00	−12	−08	−02															
9. Education	4.76	1.84	−01	−06	11	16	10	−09	−10	06														
10. Job tenure	2.88	2.85	07	10	−16	−06	02	42	−21	−00	−05													
11. Company tenure	10.29	6.52	04	12	−10	−15	−03	29	−12	−14	−26	13												
Superiors' demographics																								
12. Age	44.13	7.45	06	19	−15	−20	01	29	03	−06	−10	24	22											
13. Gender	1.04	0.19	14	09	04	−02	−02	03	10	09	05	−08	−04	−10										
14. Race	1.03	0.16	−04	−04	−00	01	−03	−08	06	30	03	−10	−09	−06	09									
15. Education	5.25	1.55	04	06	−03	03	04	01	02	13	32	−03	−09	−15	02	03								
16. Job tenure	3.61	4.09	02	09	−16	−20	01	24	10	01	−05	26	04	45	02	−09	−04							
17. Company tenure	13.00	7.32	−01	05	−06	−08	−09	12	−07	−10	−12	03	36	35	−17	−11	−17	21						
Relational demographic variables																								
18. Age	92.84	165.43	−02	−02	06	−04	−02	−14	22	−04	05	−01	−15	34	01	02	−10	12	−00					
19. Gender	0.27	0.45	05	−01	05	−08	06	−28	91	−03	−07	−20	−10	01	10	00	−05	07	−06	27				
20. Race	0.08	0.27	−17	−14	−00	−05	−12	−08	01	82	02	03	−12	−06	02	22	05	01	−07	−00	05			
21. Education	4.25	6.08	−02	−11	−15	−11	−06	16	05	−05	−35	06	16	07	−00	−07	−05	00	07	05	07	−05		
22. Job tenure	19.93	62.03	−01	−02	−03	−18	01	28	14	−04	−14	24	07	35	11	−05	−11	76	20	06	07	−03	−03	
23. Company tenure	68.92	128.52	00	−01	−02	−07	−07	07	−05	−00	03	09	−09	27	−08	−07	−09	11	37	16	−04	−00	−04	19

[a] Decimals have been omitted. Correlations of .19 or greater are significant at $p < .05$ or lower.

226–228), we did not find a multicollinearity problem. Further, blocked regression is intended to handle the multicollinearity problem among independent variables. In the regression analysis, we deleted one of the two variables with a high intercorrelation—subordinates' gender and the difference score on gender—and the magnitude of the overall model decreased. Still further, both of the two correlated variables have significant *t*-values on their regression coefficients, suggesting that they are both contributing unique variance to the dependent measure. All in all, multicollinearity does not appear to pose a threat to the validity of the results.

Table 3 presents the regression results. The results of all four regression equations were significant, suggesting the importance of demographic variables in predicting reputational effectiveness, liking, and role perceptions. We first discuss the results for the relational demographics that pertain to the hypotheses. Then, we report additional insights obtained from the results for the simple demographic variables.

Overall, the relational demographics contributed significantly to three of the four outcome measures, with 13 significant coefficients out of 24 possible. Five of the six relational demographic variables have significant regression weights on one or more of the four outcome measures. The only nonsignificant variable is company tenure. Interestingly, this was the only demographic variable for which we did not postulate any relationship to the outcome measures. These results support the general hypothesis that demographic differences between a subordinate and a superior may have significant effects on outcomes such as performance evaluation, supervisory affect, and the role perceptions of the subordinate. After we had controlled for the simple demographics and for the recent official performance rating, the six relational demographic variables accounted for 8 percent of the variance in role ambiguity, 6 percent of the variance in supervisory affect, 4 percent of the variance in the reputational effectiveness rating, and 3 percent of the variance in role conflict.

In interpreting the results for Hypotheses 1a through 1d, we focused on the block of relational demographic variables. We shall discuss each corollary hypothesis in turn. Thus, reading the results in Table 3 across rather than down the columns will facilitate understanding.

Hypothesis 1a related differences in race and gender to the performance effectiveness and supervisory affect variables. The results shown in Table 3 support the hypothesis regarding gender differences. The subordinates in mixed-gender dyads were rated as performing more poorly and were liked less well than the subordinates in same-gender dyads. Furthermore, subordinates in mixed-gender dyads also reported higher levels of role ambiguity and role conflict. Additional analyses suggest that woman subordinates with woman superiors reported the lowest level of role ambiguity, were rated to be most effective, and were liked most by their superiors. Men with women as superiors reported the highest level of role ambiguity. Men and women with men as superiors showed little difference on all the outcome measures.

On the other hand, we found no support for a race difference effect.

TABLE 3
Results of Regression Analysis of Relational Demographics on Outcome Variables

Demographic Variables	Outcome Variables[a]			
	Reputational Effectiveness	Supervisory Affect	Role Ambiguity	Role Conflict
Control variable				
Official performance rating	.46**	.31**		
Change in R^2	.20**	.09**		
Subordinates' demographics				
Age	−.13†	−.12†	−.08	−.13
Gender	.43**	.27†	−.40**	−.45**
Race	−.24*	−.34**	.27*	.12
Education	−.06	−.14*	.06	.07
Job tenure	.13*	.12†	−.10	.04
Company tenure	.05	.08	−.04	−.12
Change in R^2	.07**	.09**	.07**	.06*
Superiors' demographics				
Age	.06	.21**	−.07	−.07
Gender	.19**	.18**	−.02	−.02
Race	.01	.02	−.06	.00
Education	.04	.12†	−.04	.01
Job tenure	.10	.16	−.34**	−.17
Company tenure	.02	−.02	.03	.05
Change in R^2	.04†	.08**	.06*	.02
Relational demographics				
Age	−.05	−.07	.10†	−.00
Gender	−.38**	−.28*	.37**	.32*
Race	.08	.17†	−.22*	−.18†
Education	−.01	−.16**	−.11†	−.05
Job tenure	−.19*	−.24**	.33**	.06
Company tenure	.07	−.01	−.07	−.08
Change in R^2	.04*	.06**	.08**	.03
Overall R^2	.32	.27	.16	.14
Adjusted R^2	(.26)	(.21)	(.09)	(.07)
Overall F	5.15**	4.10**	2.22**	1.89*
df	19,207	19,207	18,208	18,208

[a] Entries are standardized regression coefficients. We used one-tailed tests for partial regression coefficients on the relational demographic variables and two-tailed tests on all the simple demographic variables.

† $p < .10$
* $p < .05$
** $p < .01$

Subordinates in mixed-race dyads were not rated differently from subordinates in same-race dyads on effectiveness. Further, the positive regression sign suggests that subordinates in mixed-race dyads were liked slightly more than subordinates in same-race dyads ($p < .10$). Additional analyses revealed that white subordinates received the highest affect ratings from black superiors and black subordinates received the lowest affect ratings from the

black superiors. A nonhypothesized association between race differences and role ambiguity and role conflict also emerged. However, the direction of the relationship was again counterintuitive. Further analyses, however, indicated that white subordinates with black superiors reported the highest level of role ambiguity and role conflict. Black subordinates reporting to white superiors, on the other hand, reported the lowest level of role ambiguity. These findings clearly extend our current knowledge about race effects (Kraiger & Ford, 1985).

The relationship of age differences in a dyad to the role ambiguity experienced by the subordinates (Hypothesis 1b) was marginally supported. Subordinates in dyads with larger differences in age reported higher levels of role ambiguity ($p < .10$). Additional analyses revealed that subordinates who were either younger or older than their superiors reported more role ambiguity than subordinates of the same age. Age differences, contrary to the hypothesis, were not related to the effectiveness ratings made by the superiors. Thus, Hypothesis 1b was only partially supported.

Partial support also emerged for Hypothesis 1c. Educational differences in the dyads were negatively associated with the supervisors' liking of the subordinates, consistent with the hypothesis. However, this relational measure is also negatively associated with subordinates' role ambiguity, contrary to the hypothesis. Additional analyses indicated that subordinates with less education than their superiors were liked better, but those subordinates also reported lower role ambiguity than subordinates who had the same or more education than their superiors. There was no systematic association between educational differences and subordinate role conflict.

Hypothesis 1d specified that differences in job tenure would be positively associated with increased role ambiguity as experienced by the subordinates. Results supported that relationship. In addition, differences in job tenure were also negatively associated with both effectiveness and supervisory affect ratings. Additional analyses suggested that superiors saw subordinates with either more or less time in their current job than the superiors had as less effective performers than subordinates with job tenure equivalent to their superiors'. However, superiors liked subordinates with shorter job tenure than themselves better than they liked subordinates with either the same or longer job tenure. In addition, the subordinates with shorter job tenure reported the highest level of role ambiguity. Subordinates with longer job tenure than their superiors reported the lowest level of role ambiguity. These results provide full support for Hypothesis 1d.

In summary, the results on the relational demography variables are generally consistent with the hypotheses. We hypothesized that differences in gender and race would have a negative relationship with supervisory affect and with effectiveness ratings (Hypothesis 1a) and observed a significant effect on affect and role ambiguity. We postulated that differences in age would be related to role ambiguity and to a subordinate's effectiveness as rated by a superior (Hypothesis 1b). The former was supported but the latter was not. Hypothesis 1c, concerning differences in educational level, re-

ceived general support. The predicted association between role ambiguity and affect was observed, but educational differences had no relationship with role conflict. Difference in job tenure was related not only to role ambiguity, as expected (Hypothesis 1d), but also to superiors' effectiveness and affect ratings. Finally, as we suspected, company tenure had no relationship to any of the outcome variables. In summary, we found support for seven of the ten predicted effects. Further we found several unpredicted effects that were consistent with the general hypothesis. This further strengthens the basic thesis of this study, that relational demography will have effects on job outcomes above and beyond the effects of simple demographics.

Though we were not specifically interested in the simple demographic variables other than as controls, several interesting findings emerged that merit some discussion. For example, subordinates' demographic attributes contributed significantly to all four outcome measures. Superiors rated older subordinates as less effective and liked them less than younger subordinates. Women received higher effectiveness ratings, were liked more, and reported lower levels of role ambiguity and role conflict. Black subordinates were rated lower in effectiveness, were liked less well, and reported a higher level of role ambiguity than did white subordinates. Superiors liked subordinates with more education than themselves less than they liked subordinates with less education. Subordinates with long job tenure were rated as more effective and liked better than subordinates with short job tenure. Results for the superiors' demographics suggest that older superiors expressed more positive affect toward their subordinates than did younger superiors. Women gave higher effectiveness and affect ratings. Finally, a high level of role ambiguity was reported by subordinates whose superiors had short job tenure. Most, though not all, of these simple demographic effects corroborated and extended existing research on employee characteristics. Further, these results were net of the influence of the demographic attributes of the other member of each dyad and of the demographic differences between them.

DISCUSSION AND SUMMARY

This study demonstrated the importance of relational demography for understanding employee job outcomes. We observed relational demographic effects even after controlling for the influence of the simple demographic characteristics of both the subordinates and superiors in the dyads studied. Results show particularly strong effects in mixed-gender dyads and dyads of people with different job tenures. The gender effect corroborated current research results on gender. Favorable outcomes were observed for woman subordinates with woman superiors. However, this finding does not totally support the same-gender bias effect (Mobley, 1982), since men did not rate subordinates who were men more favorably than they rated subordinates who were women. Results on tenure differences in the dyads also provided insight that is not evident from existing research (Giniger et al., 1983;

Mitchel, 1981). Subordinates with shorter job tenure than their superiors received the most favorable affect ratings of all subordinates. One possible explanation for this phenomenon may be that the superiors had recently promoted or selected these subordinates, which would lead to the subordinates having a shorter job tenure than the superiors. Employment selection research has consistently found a tendency for people to hire someone who is similar to themselves with respect to attitudinal or demographic dimensions (Arvey & Campion, 1982). Thus, this favorable affect rating may reflect both justification of a selection decision and attraction due to similarity on other demographic dimensions.

The results for role ambiguity and job tenure are also interesting. Subordinates' job tenure itself was unrelated to role ambiguity. However, high role ambiguity was associated with superiors' short job tenure. Further, the effects of differences in job tenures were not the same for subordinates with longer job tenure than their superiors and for those with shorter job tenure. As we expected, subordinates with longer job tenure than their superiors reported a lower level of role ambiguity than subordinates with either the same or shorter tenure. Differential job experiences in a dyad may lead to communication problems (Roberts & O'Reilly, 1979), consequently affecting the level of role ambiguity experienced by the subordinate.

The different results for job and company tenure suggest the importance of both the conceptual and operational clarity of the tenure concept. This research indicates that job tenure is a more important and relevant construct than company tenure for analyzing the relationship in a subordinate-superior dyad (McCain et al., 1983).

The results for age differences clearly extend earlier research findings. Waldman and Avolio (1986) concluded from their meta-analysis that older workers were consistently rated lower than younger workers. In our study, superiors not only rated older workers as performing less well, but also liked them less well than younger workers. However, we could not tell from this study if the lower effectiveness ratings for older subordinates reflected actual performance or simply a bias. It is also interesting to discover that subordinates who were either younger or older than their superiors reported a higher level of role ambiguity than subordinates who were the same age as their superiors. Although this effect is weak, it is interesting to note the additional information provided by examining comparative age.

The findings on race also extend the results of earlier studies that have found a significant, albeit small, same-race bias in performance ratings (Kraiger & Ford, 1985). The results of this research suggest a possible reason for lower ratings in mixed-race dyads. Subordinates in mixed-race dyads, especially white subordinates with black superiors, reported role ambiguity and conflict, often deterrents to performance. Communication and status incongruence problems in mixed-race dyads may explain these findings.

Finally, the results for educational differences provided further insight into the importance of this demographic variable. Neither the education of

each member of a dyad nor educational differences between them had any effect on the effectiveness and role conflict ratings. We observed effects, however, on supervisory affect and role ambiguity. These findings suggest a potential negative dynamic in superior-subordinate dyads in which the superior has the same or less education than the subordinate.

Although the overall relational demography hypothesis was supported, additional analyses showed the effect may be positive rather than negative in some special cases. For instance, we noticed that job outcomes seemed favorable for subordinates who, compared to their superiors, were younger, had less education, and less job tenure. In these dyads, the superiors may have been more secure and confident in their roles, suggesting that relational demography may be important not only for indexing social distance or similarity in goals and values associated with understanding and acceptance, but also for indexing the psychological comfort of superiors, including feelings of confidence and power.

This study, with some limitations, makes several contributions to the demography literature. It extends the concept of demography to the dyadic level, whereas the extant research on demography has tended to focus at either the organizational level, representing the sociological tradition, or the individual level, representing the industrial-organizational psychology tradition. The concept of relational demography captures the dynamic interactions associated with demographic differences in dyads. It has the potential to be extended to analyzing demographic effects in coacting or interacting small groups.

This study also argued for and demonstrated the importance of examining multiple demographic variables, since people are represented by a demographic profile rather than by one or two demographic variables. The results show that a constellation of demographic variables explain an amount of variance larger than what has been shown in existing literature on similar variables. These variables have traditionally accounted for less than 5 percent of the variance in outcome measures (Cleveland & Landy, 1981; Mobley, 1982). The sample in this study was of a reasonable size, so the results are unlikely to be an artifact of a small variable-to-sample ratio.

Our argument has been that the study of relational demographic variables offers insights above and beyond those provided by analysis of simple or direct demographic variables. The results of this study indeed show that considering relational demography can lead to significant incremental contribution. By including both the simple demographic variables and their relational forms, we more than doubled the amount of variance explained, suggesting the importance of considering the compositional effects or nonlinear impacts of these variables. This research suggests the importance of examining the full impact of demographic variables. However, though the relational measures explain variance above and beyond simple direct effects, the incremental contribution is relatively small, especially on the two role measures. The small amount of variance explained, however, should not

deflate the importance of the demographic variables because role ambiguity and role conflict are clearly affected by many other nondemographic factors in job settings (Jackson & Schuler, 1985).

Importantly, the demographic predictions made here were consistent with taking the similarity-attraction paradigm as a basic theoretical foundation. We postulated that demographic similarity would be associated with attitudinal and value similarity, which may enhance interpersonal attraction and increased frequency of communication. Communication can in turn reduce role ambiguity. The study showed direct links between demographic similarity and interpersonal attraction, although it only measured superiors' attraction to subordinates. We did not directly assess attitudinal or value similarity or frequency of communication as intermediary processes. Although there is research linking relational demography and communication (e.g., Zenger & Lawrence, 1989), more fine-grained examinations of the attitudinal and cognitive processes that link demographic similarity to job outcomes are desired. In conclusion, this study has suggested other avenues for future research on relational demography and job outcomes.

What advice might we give managers based on this research? Pfeffer (1985) outlined several managerial implications of demographic effects at the group and organizational levels. Similar concerns and advice might also be appropriate at the dyad level. For example, five of the six relational variables affected role ambiguity. Those effects might indicate potentially important situations that superiors should not ignore. Superiors might want, for instance, to increase communication when they differ in demographic background from subordinates, especially on multiple demographic measures. At least four of the six relational demographic variables affected superiors' liking for subordinates. To the extent that a superior's liking a subordinate is desirable, offering the latter either psychological or instrumental value, individuals might want to attend to the demographic profile of potential superiors in selecting or accepting job assignments, transfers, and job offers. By becoming aware that demographic similarities could result in liking a subordinate, superiors might exercise caution to prevent such liking from biasing other judgment or employment decisions.

Clearly, this research does not suggest, nor do we advocate, that it is best for organizations to hire people who most clearly match the demographics of current managers. If an organization has white men as managers, should it simply hire more white men? This is a managerial decision involving a value stance as well as legal implications. This research simply reports the potential outcomes of discrepancies in demographic profiles. Managerial discretion and pragmatism are always needed in applying research results.

Although the amount of variance relational demography accounted for is small, the study clearly suggests that demography at the dyadic level can and should be examined beyond the simple one- or two-variable analysis that characterizes much of the literature. Relational demography has the potential to capture the impact of demographic effects more fully and also

offers a bridge between the individual and the organizational levels of analysis.

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