Self-efficacy changes in groups: effects of diversity, leadership, and group climate

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Summary   Self-efficacy belief is a significant predictor of behavioral choices in terms of goal setting, the amount of effort devoted to a particular task, and actual performance. This study conceives of formation and change of self-efficacy as a social and context-dependent process. We hypothesized that different group factors (discretionary and ambient group stimuli) influence changes in members' self-efficacy through differing routes (individual-level and cross-level processes). We tested our hypotheses using data from individuals in 169 training groups who attended a 5-day workshop designed to increase participants' job-search skills and efficacy. Specifically, we examined the degree of change in participants' job-search efficacy before and after the workshop. The results showed that (a) membership diversity in education was positively related to increases in job-search efficacy, (b) supportive leadership contributed to job-search efficacy at the individual level of analysis with no cross-level effects, and (c) open group climate contributed to job-search efficacy through both individual-level and cross-level processes. Limitations and directions for future research are discussed. Copyright © 2003 John Wiley & Sons, Ltd.

Introduction

A well-established predictor of people's behavior and performance is their self-efficacy expectation, defined as beliefs in one's capabilities to organize and execute courses of action (Bandura, 1997). Self-efficacy has been identified as a key predictor of many aspects of behavioral choices including level of aspiration, task persistence, positive or negative ways of thinking and feeling, and actual task performance (Bandura, 1997; Gist, 1992). Indeed, many training programs and organizational change efforts are aimed at changing employees' efficacy beliefs (Malone, 2001) since 'self-efficacy represents a dynamic (i.e., changeable) and comprehensive judgment reflecting a variety of personal and task-related performance determinants' (Gist, Stevens, & Bavetta, 1991, p. 839).

As many scholars have recognized, changes in individual skills and attitudes occur through social processes such as informal discussions and feedback from social interactions (Brown & Duguid, 1991). Groups represent an immediate social context that shapes how individual members think and feel (Hackman, 1992). In fact, studies have shown that group settings can change individuals' motivation

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(Latané, Williams, & Harkins, 1979), attitudes (e.g., post-discussion attitude polarization; Brauer, Judd, & Gliner, 1995), and behavior (Schlenker & Weigold, 1992). The present study focuses on the group as a social context for the formation of its members' efficacy beliefs and examines how different group variables such as group composition and leader and group characteristics influence changes in self-efficacy of individual members.

In our investigation of how efficacy beliefs are shaped by group characteristics, we distinguish two separate routes of group influence on individuals (Klein, Dansereau, & Hall, 1994). The first route involves an individual-level process—that is, the influence of individuals' own experiences within the group (e.g., personal perception of the leader) on their attitude and behavior. The second route involves a cross-level process, or the influence of group characteristics (e.g., group composition) and group processes (e.g., group climate) on a particular member. Unlike prior studies, this investigation simultaneously tests both processes. In doing so, it also identifies two conceptually distinguishable sources of group influence (discretionary vs. ambient group stimuli) and proposes individual-level and cross-level processes involving these two types of group stimuli.

We tested our hypotheses using data collected from individuals in 169 groups attending a 5-day workshop. The workshop was designed to help unemployed participants by increasing job-search skills instrumental to obtaining reemployment (Vinokur, Price, & Schul, 1995). The group workshop was led by two trainers who addressed diverse challenges facing unemployed individuals, such as identifying their transferable skills, finding job openings, and conducting interviews. Workshop participants spent more than half of the time interacting among themselves, facilitated by the trainers. Specifically, the workshop included a series of structured interactive exercises, brainstorming sessions, discussions, and role-play activities. In this empirical context, an increased self-efficacy expectation regarding job-search skills (job-search efficacy) reflects positive changes in participants' perceptions of their job-search skills.

Different Types of Group Stimuli for Individuals

Hackman (1992) observed that group members are exposed to and influenced by two types of stimuli from the group. The first type involves *discretionary* stimuli that 'are transmitted or made available to individuals differentially and selectively at the discretion of the other group members' (Hackman, 1992, p. 201). Examples of discretionary stimuli include messages of approval or disapproval, role negotiation or differentiation, and leader–follower exchanges. The second type of stimuli from the group involves *ambient* stimuli that are available to all group members and pervade the group setting. Examples of ambient stimuli are group composition, shared group norms, climate, and the task environment.

We propose that these two types of group stimuli shape members' self-efficacy through different mechanisms of influence. On the one hand, the effect of discretionary stimuli on members may be limited to the focal individual exposed to the particular stimulus (e.g., role-specific communication, leader–member dyadic relationship). Even when other members are exposed to the same stimulus (e.g., observing other members' interactions with the leader in a group meeting), this type of stimulus often bears significance only for the target recipient, without any 'ripple effects' to other members.

Ambient stimuli, on the other hand, are not targeted to a specific group member. Rather, group members are collectively exposed to ambient stimuli and are collectively affected by them. Other members' cognitions often comprise a source of ambient stimuli (e.g., mutual expectations for interaction, shared trust among members). For this reason, a focal member may be affected by his/her own perception of an ambient stimulus (individual-level process) as well as by other members' perceptions of the same stimulus

(cross-level process). Drawing on these distinct influence processes of discretionary and ambient stimuli, we now develop a set of hypotheses for three core group characteristics: diversity in group composition, leadership variables, and group variables reflecting relationships among members.

Diversity in group composition

Research has shown that diversity in group members' social characteristics influences interaction patterns among members as well as individual and group performance (Chatman, Polzer, Barsade, & Neale, 1998; Simons, Pelled, & Smith, 1999; Tsui, Egan, & O'Reilly, 1992). Based on these findings, we expect that social characteristics within a group operate as ambient group stimuli that exert cross-level influences on member outcomes, including changes in self-efficacy beliefs.

Research has shown that differences among members provide conditions for more and diverse information and viewpoints, richer discussion, and more complete analysis (Chatman et al., 1998; Nemeth, 1986; Simons et al., 1999). In the present empirical context, which involves participants in job-search workshops, membership diversity in social characteristics might provide participants with a rich array of alternative approaches and skills for job search, and thus enhance their job-search efficacy. Studies have shown that job-seekers with differing demographic characteristics in terms of age, gender, race, and education tend to adopt different strategies (e.g., sending a résumé vs. an application, contacting the union vs. the HR manager, using private vs. public employment agencies) and use distinct sources of information (e.g., online vs. offline materials, formal vs. informal network connections) for job search (Kuhn & Skuterud, 2000; Ports, 1993). Thus, membership diversity in these demographic attributes may facilitate an increase in participants' job-search efficacy following group interaction.

> *Hypothesis 1*: Group diversity in age, gender, race, and education is positively related to increases in job-search efficacy subsequent to the group workshop.

Supportive leadership and positive leader perception

Leaders influence individual members' growth and achievement by allowing members to freely share their ideas and experiences (Oldham & Cummings, 1996). In particular, supportive leader behavior and positive perceptions of the leader may be critical for creating a trusting group environment that is favorable to individual development (Edmondson, 1999). The perception of 'psychological safety' by group members is positively related to favorable social processes including frequent feedback, information seeking, and open discussion of errors (Edmondson, 1999; Oldham & Cummings, 1996). Given that an important information cue for self-efficacy judgment is feedback from others, particularly from trustworthy others (Bandura, 1997; Gist, 1992), supportive leaders may increase members' self-efficacy by offering more frequent positive feedback.

According to leader–member exchange theory (Graen & Scandura, 1987), leaders influence their followers through differentiated relationships they form with each of them. In fact, multi-level investigations of transformational leadership theory have also revealed that '[leader] effects were based on individual differences in subordinates' perceptions of leadership ... that were *independent of their group membership*' (Yammarino & Dubinsky, 1994, p. 792, italics added). Based on these findings, we regard leader influences on members as discretionary stimuli that influence member-specific perceptions and lead to distinct outcomes for each member. Consequently, we hypothesize that the influence of leadership variables on changes in self-efficacy is realized largely through individual-level processes rather than through cross-level processes.

Hypothesis 2a: Supportive leadership and positive leader perceptions are positively related to increases in job-search efficacy subsequent to the group workshop.

Hypothesis 2b: Group-level aggregated supportive leadership and positive leader perception are unrelated to increases in job-search efficacy subsequent to the group workshop.

Open group climate and positive group perception

Members' perception of group climate has an important effect on their behavior and interactions because it reflects individuals' cognitive representations of the group environment based on their inter-actions within the group (Anderson & West, 1998; Schneider & Reichers, 1983). A group climate that is characterized by open communication and trusting relationships among members may be related to positive changes in members' self-efficacy because it allows experimentation with new ways of doing things, the practice of new skills without fear of appraisal, and frequent and open exchanges of feed-back (Anderson & West, 1998; Edmondson, 1999). In addition, a positive perception of the group may also signal that members perceive the group setting as a psychologically safe environment for explor-ing and practicing new skills.

Perceptions of group characteristics such as climate are not based on a single dyadic relationship within the group, but are based on overall interaction patterns among members and the atmosphere that characterizes interactions within the group. Thus, group climate and group perceptions represent 'ambient' stimuli that reflect the nature of the whole group rather than a particular member or a parti-cular dyadic linkage within the group (Hackman, 1992). Group-level phenomena such as shared norms, collective mind (Weick & Roberts, 1993), and group information processing (Hinsz, Tindale, & Vollrath, 1997) can be characterized as properties of the collective entity. As ambient stimuli per-vading the group setting, these collective properties may have cross-level effects on every member of the group (Hackman, 1992). Therefore, we hypothesize that:

Hypothesis 3a: Open group climate and positive group perceptions are positively related to increases in job-search efficacy subsequent to the group workshop.

Hypothesis 3b: Group-level aggregated open group climate and positive group perception are positively related to individual members' increases in job-search efficacy subsequent to the group workshop.

Method

Research setting

Data were collected from participants who attended a standardized group workshop offered by three organizations. Specifically, the workshop included a series of structured interactive exercises, brain-storming sessions, discussions, and role-play activities taking place over a period of 5 days. To facil-itate participant learning experiences, the workshop was designed to enhance specific group characteristics that included: (a) active participation, (b) a safe group-learning environment, (c) posi-tive interactions among group members and with the trainers, (d) mutual support among members, and

(e) enhanced trust of trainers. In addition, the physical setting was also designed to facilitate interactions among participants—the workshops were held in conference rooms furnished with small tables and refreshments.

The three research sites were located in the western United States and included a community-based non-profit organization in a rural area, a public education agency in a large metropolitan area, and a federally funded training agency operating in a mid-sized city. All these sites delivered employment and professional training to diverse populations. The three sites were selected as part of an employment training initiative sponsored by a non-profit foundation. In each organization, four to six trainers were involved in the workshops. They had all attended an intensive 1- or 2-week training-the-trainer program offered by the developer of the workshop. The content, format, process of the workshop, and the data collection procedure at each site were regularly monitored by an independent evaluation team in order to monitor quality and ensure the uniformity of the workshop delivery across the sites. We combined the data from these sites to achieve the statistical power necessary for group-level analyses.[1]

Data collection procedure and participants

We conducted our research over a 1-year period in the three organizations and used the same measures and data collection procedures in each. A pre-test questionnaire ($T1$) was administered prior to each new workshop and a post-test questionnaire ($T2$) to be completed and mailed back to the organization was distributed to participants after the workshop. With a postcard reminder, most participants returned the post-test survey within 3 weeks (response rate = 69 per cent). The initial sample included 2978 participants from 258 workshop groups. We first selected individual cases for which both pre- and post-measures were available, because the present dependent variable (increases in job-search efficacy) required a comparison of job-search efficacy levels assessed before and after the workshop. Then, to ensure the representativeness of the sample with regard to group-level dynamics, we removed groups from the sample for which the response rate fell below 50 per cent (Simons et al., 1999; Tsui et al., 1992). This pre-screening procedure resulted in a final sample with 1202 individuals in 169 groups. Groups in the final sample averaged 11.8 participants (the range was 3–23).

To examine potential selection bias introduced by the screening criteria, we compared the demographic profiles of the participants in the final sample and those excluded in terms of gender (41 per cent vs. 43 per cent males in the final and excluded sample, respectively), race (40 per cent vs. 39 per cent whites), age (38.9 vs. 38.9 years), education (13.3 vs. 13.2 years), and the size of the workshop group (13.6 vs. 13.2). This comparison suggests that there was no substantial selection bias introduced by the screening criteria.

Measures

Demographic variables
In the pre-workshop assessment ($T1$) we asked participants to report on four demographic characteristics, including age, education (in years), gender (male = 0, female = 1), and race (1 = Asian, 2 = Hispanic, 3 = African American, 4 = white).

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[1] The response rates in the three research sites were similar (63.8 per cent, 73.2 per cent, and 70.1 per cent) and participants had comparable increases in job-search efficacy across sites. To examine potential differences in relational patterns across sites, we tested the identical hierarchical linear model that is presented in the last column of Table 4 for each of the three sites separately. The pattern of these three sets of results was similar to the results based on the combined data set (although overall statistical significance levels diminished due to a smaller number of groups within each site).

Diversity in group composition

We calculated diversity coefficients for each group using the demographic information reported by participants. To create diversity coefficients for age and education, we adopted the coefficient of variation suggested by Allison (1978). In this approach, a scale-invariant index of diversity can be calculated by dividing the standard deviation by the mean. For example, in this study, we calculated age diversity of a group by dividing the group's standard deviation for age by its mean age. The same procedure was applied to obtain a group's education diversity.

For the two categorical composition variables (gender, race), we used an approach suggested by Teachman (1980). An entropy-based diversity index is calculated by an equation:

$$H = -\sum_{i=1}^{n} P_i (\ln P_i)$$

where i is a particular category, n is the total number of possible categories, and P_i is the proportion of the members of the particular category within the group. For example, if we have two Asians, two Hispanics, a white person, but no African Americans in a group, the race diversity coefficient of this group is $-[0.4 \times \ln(0.4) + 0.4 \times \ln(0.4) + 0.2 \times \ln(0.2) + 0.0 \times \ln(0.0)] = 1.05$. The same formula was used to calculate a group's gender diversity. For both the coefficient of variation and the entropy-based diversity index, a group is more heterogeneous when these indices of diversity have larger values.

Supportive leadership and positive leader perception

In the post-test assessment ($T2$) we asked participants to rate their workshop leaders' supportive behavior and evaluate their personal characteristics. The supportive-leadership scale included five items ($\alpha = 0.78$) followed by a five-point scale ($1 = not\ at\ all$, $5 = a\ great\ deal$) that measure supportive behaviors of the trainers during the 5-day workshop (see Table 1 for items). The positive-leader-perception scale (four items, $\alpha = 0.87$) measured key personal characteristics of the workshop leaders such as enthusiasm, warmth, and expertise, using seven-point scales.

Open group climate and positive group perception

The post-test questionnaire also measured participants' experiences with the other group members. Open group climate was assessed by four items ($\alpha = 0.68$) asking about interaction patterns among members and general group atmosphere using five-point scales. The positive-group-perception scale was composed of five items ($\alpha = 0.93$) that measured participants' overall attitudes toward their group using seven-point scales. The four scales measuring leader- and group-related variables were constructed specifically for this study to evaluate the targeted active ingredients of the workshop in terms of group dynamics involving trainers and participants. The content covered in these four scales (see Table 1), however, substantially overlaps with existing measures designed to assess similar constructs, such as supervisory support and participative safety (e.g., Anderson & West, 1998; Oldham & Cummings, 1996).

Aggregation of leader and group characteristic variables

To obtain group-level measures of leader and group characteristics, we aggregated individual members' ratings at the group level by using means. Conceptually, the present predictors address group-level phenomena such as group climate, and thus the aggregated scores may reflect the collective perceptions of members (Klein et al., 1994). Empirically, all eta-squares (i.e., the proportion of variance attributable to group membership) of the four group process measures were greater than Georgopoulos's (1986, p. 40) criterion for aggregation of 0.20 (in this study, ranging between 0.52 and 0.65), indicating that participants from the same group responded in a more similar way than those from different groups.

Table 1. List of items and factor loadings for scales measured at $T2$

Factor	Item	Factor loading				
		1	2	3	4	5
1. Supportive leadership	1. How much did the trainers provide equal opportunities for people to share?	**0.76**	0.03	0.02	0.13	0.13
	2. How much did the trainers give the group opportunity to answer people's questions?	**0.69**	0.01	0.22	0.15	0.16
	3. How much did the trainers respond with specific examples?	**0.68**	0.20	0.14	-0.04	0.21
	4. How much did the trainers listen closely to comments?	**0.63**	0.19	0.24	0.20	0.10
	5. How much did the trainers seem like they understood your problems?	**0.57**	0.22	0.36	0.05	0.19
2. Positive leader perception	6. How much did you feel the trainers were knowledgeable?	0.13	**0.81**	0.11	0.29	0.10
	7. How much did you feel the trainers were enthusiastic?	0.18	**0.76**	0.10	0.26	0.02
	8. How much did you feel the trainers communicated clearly?	0.09	**0.73**	0.09	0.38	0.07
	9. How much did you feel the trainers were warm?	0.15	**0.70**	0.03	0.44	0.06
3. Open group climate	10. How much did you feel that you could trust others in the group?	0.15	0.04	**0.77**	0.13	0.13
	11. How much did you feel that other participants shared their experiences?	0.19	0.01	**0.67**	0.15	0.15
	12. How much did you feel comfortable to participate?	0.12	0.19	**0.65**	0.12	0.12
	13. How much did you feel that other participants have the same problems?	0.18	0.04	**0.56**	0.12	0.12
4. Positive group perception	14. How much did you feel the group was accepting?	0.07	0.23	0.13	**0.85**	0.08
	15. How much did you feel the group was sincere?	0.11	0.25	0.11	**0.84**	0.10
	16. How much did you feel the group was supportive?	0.11	0.20	0.16	**0.83**	0.09
	17. How much did you feel the group was warm?	0.10	0.27	0.13	**0.82**	0.10
	18. How much did you feel the group was enthusiastic?	0.14	0.28	0.18	**0.78**	0.09
5. $T2$ job-search efficacy	19. How confident do you feel about persuading potential employers?	0.08	0.10	0.09	0.03	**0.81**
	20. How confident do you feel about making the best impression in interview?	0.03	0.08	0.11	0.03	**0.79**
	21. How confident do you feel about talking to others to get job openings?	0.14	-0.03	0.19	0.12	**0.75**
	22. How confident do you feel about talking to others about potential employers?	0.23	-0.05	0.17	0.13	**0.74**
	23. How confident do you feel about making a list of your skills?	0.19	0.03	0.19	0.13	**0.71**
	24. How confident do you feel about completing an application and resume?	0.13	0.12	0.05	0.03	**0.69**

Note: The level of analysis is the individual ($N = 1202$).
Factor loadings of the corresponding items within the scale are in bold face.

The dependent variable: increases in job-search efficacy

Using a six-item index ($\alpha = 0.89$) validated by Vinokur, Price, and Caplan (1991), we collected participants' self-assessment of their job-search efficacy at both pre-test and post-test. The job-search efficacy scale measured various skills needed for successful job search and reemployment (Vinokur et al., 1995). The response format included five points ranging from 'not at all' to 'a great deal.'

Analytic strategy: hierarchical linear modeling

To examine the effects of predictors at multiple levels of analysis, we employed multivariate hierarchical linear modeling (HLM; Bryk & Raudenbush, 1992). In this study, we attend to variables at three levels of analysis: (a) the within-individual level that represents time-dependent changes within participants, (b) the individual level that differentiates a person from others, and (c) the group level that addresses the effects of group-level variables. In the first level of analysis, we map the trajectory of individual changes from pre- ($T1$) to post- ($T2$) measures. The rate of change identified at this first level comprises the outcome of this study. For example, the within-individual-level equation for job-search efficacy is

$$y = \pi_0 + \pi_1 T + e$$

where y = within-individual-level outcome (job-search efficacy at $T1$ and $T2$), π_0 = intercept or initial status (job-search efficacy at $T1$), π_1 = rate of change in job-search efficacy from $T1$ to $T2$, T = time vector (0 for $T1$, 1 for $T2$), e = level 1 random error (σ^2).

The second level involves individual factors, such as age or race, as well as individual experiences with the group. At this level, we address the question of whether disparate group experiences actually produce different rates of change in job-search efficacy over time. The following equations demonstrate how the two-level equations can be created:

$$y = \pi_0 + \pi_1 T + e$$
$$\pi_0 = \beta_{00} + \beta_{01} \text{ Age} + r_0 \tag{1}$$

$$\pi_1 = \beta_{10} + \beta_{11} \text{Age} + \beta_{12} \text{Group Climate} + r_1 \tag{2}$$

where π_i = individual-level outcomes, β_{00} = average level of job-search efficacy across individuals at $T1$, β_{10} = average rate of change in job-search efficacy from $T1$ to $T2$ across individuals, and r_i = level 2 random error. Equation (1) shows how we controlled the effects of individual characteristics (e.g., age) on the initial level of job-search efficacy (π_0). Equation (2) tests the effects of a participant's age (β_{11}) and perception of group climate (β_{12}) on the rate of change in job-search efficacy (π_1).

Finally, the group level of analysis entails features of the group workshop, such as membership diversity. The following equations illustrate a three-level model:

$$y = \pi_0 + \pi_1 T + e$$
$$\pi_0 = \beta_{00} + \beta_{01} \text{Age} + r_0$$
$$\pi_1 = \beta_{10} + \beta_{11} \text{Age} + \beta_{12} \text{ Group Climate}$$
$$\beta_{00} = \gamma_{000} + u_{00} \tag{3}$$

$$\beta_{10} = \gamma_{100} + \gamma_{101} \text{ Age Diversity} + \gamma_{102} \text{ Aggregated Group Climate} + u_{10} \tag{4}$$

where β_{ij} = group-level outcomes, γ_{000} = average level of job-search efficacy across groups at $T1$, γ_{100} = average rate of change in job-search efficacy from $T1$ to $T2$ across groups, and u_{ij} = level 3 random error. In this example, we entered group-level variables, such as age diversity and the aggregated perception of group climate, to predict individual changes in job search self-efficacy (see Equation 4).

Results

Although this study used a longitudinal design, the predictors involving the leader- and group-related variables, as well as the post-test outcome measure, were all collected at $T2$. To test the empirical distinctiveness of these post-test measures, we factor-analyzed the 24 items comprising the five relevant scales, using a principal component analysis with varimax rotation (Podsakoff & Organ, 1986). The analysis produced five factors that corresponded to the five scales, explaining 64 per cent of the total variance. As shown in Table 1, the factor loadings of the items on the respective scales ranged from 0.56 to 0.85. This clear factor structure indicates that the five scales measured at $T2$ were empirically distinct and that any confounding from common method variance was not serious in the present data.

Tables 2 and 3 present the descriptive statistics and intercorrelations of the individual-level and group-level variables, respectively. The comparison of pre-test and post-test job-search efficacy (3.72 vs. 4.35) showed that participants experienced statistically significant increases in their job-search efficacy ($t = -25.49$, $p < 0.001$) after the workshop.

To test our hypotheses, we conducted hierarchical linear modeling analyses in a stepwise manner, where several clusters of predictors are entered sequentially into an equation that predicts the rate of change in job-search efficacy (slope-as-outcome model, Bryk & Raudenbush, 1992). Similar to unstandardized regression coefficients, the coefficients appearing in Table 4 (β for individual-level predictors, γ for group-level predictors) can be interpreted as the magnitude of the effect of the predictor on the criterion, controlling for other variables in the equation.

As shown in Table 4, demographic variables were used as controls for both the initial status of the outcome measure ($T1$ job-search efficacy) and the rate of change from $T1$ to $T2$ job-search efficacy. Demographic control variables are particularly necessary in the present analysis because people with different demographic characteristics might respond to group composition variables differently. For example, whites' perceptions of race diversity may be different from nonwhites' perceptions. Demographic control variables in the first block together explained 20 per cent of the within-individual-level variance (σ^2), which in this case represents variation among participants in the level of change in job-search efficacy from $T1$ to $T2$ (temporal variation, Bryk & Raudenbush, 1992, pp. 185–192).

Effects of diversity in group composition

Hypothesis 1 states that membership diversity in several social attributes increases workshop participants' job-search efficacy. The variables entered as the third block in Table 4 tested this hypothesis. Of the four member characteristics, diversity in education was the only social characteristic that was positively related to the increases in job-search efficacy ($\gamma = 0.95$, $p < 0.05$).

Effects of supportive leadership and positive leader perception

To test Hypotheses 2a and 2b, the two leadership variables were entered into the equation in the second block as individual-level variables and in the fourth block as group-level variables. At the individual

Table 2. Means, standard deviations, reliabilities, and inter-scale correlations: individual level $(N = 1202)$[a]

Variables	M	SD	α	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	38.92	12.54		—											
2. Female	0.59	0.49		-0.03	—										
3. Asian	0.12	0.33		0.01	-0.05	—									
4. Hispanic	0.34	0.47		-0.26	0.05	-0.27	—								
5. African American	0.13	0.34		-0.11	0.02	-0.15	-0.28	—							
6. Education	13.27	2.52		0.38	-0.00	0.17	-0.39	-0.05	—						
7. Supportive leadership	4.69	0.40	78	-0.08	0.04	-0.15	0.04	0.08	-0.09	—					
8. Positive leader perception	6.45	1.02	87	0.09	0.07	-0.05	-0.01	-0.06	0.09	0.38	—				
9. Open group climate	4.48	0.51	68	0.00	0.08	-0.08	-0.00	0.05	-0.01	0.53	0.29	—			
10. Positive group perception	6.54	0.88	0.93	0.09	0.10	-0.10	-0.01	-0.02	0.05	0.35	0.65	0.37	—		
11. T1 Job-search efficacy	3.72	0.92	0.90	-0.04	-0.01	-0.04	0.03	0.11	-0.03	0.11	0.05	0.15	0.05	—	
12. T2 Job-search efficacy	4.35	0.61	0.87	-0.14	-0.07	-0.10	0.10	0.16	-0.16	0.43	0.18	0.43	0.25	0.39	—

[a] $r > 0.06, p < 0.05$; $r > 0.08, p < 0.01$; $r > 0.10, p < 0.001$.

Table 3. Means, standard deviations, and inter-scale correlations: group level ($N = 169$)[a]

Variables	M	SD	1	2	3	4	5	6	7	8	9
1. Group size	13.60	6.39	—								
2. Age diversity	0.23	0.09	0.03	—							
3. Gender diversity	0.55	0.19	0.05	0.16	—						
4. Race diversity	0.76	0.35	0.22	0.10	0.11	—					
5. Education diversity	0.12	0.06	0.36	0.14	0.07	0.17	—				
6. Aggregated supportive leadership	4.68	0.20	−0.12	0.24	−0.04	0.19	−0.01	—			
7. Aggregated positive leader perception	6.45	0.40	0.02	0.11	−0.10	−0.01	−0.07	0.48	—		
8. Aggregated open group climate	4.47	0.24	−0.01	0.03	−0.07	0.11	−0.01	0.62	0.43	—	
9. Aggregated positive group perception	6.54	0.37	0.03	0.06	0.03	−0.03	−0.08	0.41	0.69	0.52	—

[a]$r > 0.15$, $p < 0.05$; $r > 0.19$, $p < 0.01$; $r > 0.24$, $p < 0.001$.

Table 4. Results of hierarchical linear modeling analyses

Variables	Initial status	Change rate			
		Step 1	Step 2	Step 3	Step 4
Age	0.00	0.00	0.00	0.00	0.00
Female	−0.05	−0.02	−0.07	−0.07	−0.07
Asian	−0.06	−0.01	0.04	0.04	0.04
Hispanic	0.06	0.03	0.02	0.01	0.01
African American	0.28***	−0.01	−0.05	−0.06	−0.06
Education	0.03**	−0.05**	−0.05**	−0.05***	−0.05***
Supportive leadership			0.26**	0.26**	0.26**
Positive leader perception			−0.04	−0.04	−0.04
Open group climate			0.13[†]	0.13[†]	0.12[†]
Positive group perception			0.15***	0.14***	0.14***
Group size				−0.01[†]	0.00
Age diversity				0.31	0.31
Gender diversity				0.17	0.25*
Race diversity				0.06	0.01
Education diversity				0.95*	0.93**
Aggregated supportive leadership					0.23
Aggregated positive leader perception					−0.07
Aggregated open group climate					0.57***
Aggregated positive group perception					0.06
Temporal variance (σ^2)	0.37747	0.30110	0.24236	0.24178	0.23700
Change in explained variance ($\Delta\sigma^2$)		0.07637	0.5874	0.0058	0.00478
Proportion of explained variance		(20.2%)	(19.5%)	(0.2%)	(2.0%)

[†]$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

level, supportive leadership was positively associated with the amount of change in job-search efficacy ($\beta = 0.26$, $p < 0.01$). When aggregated at the group level, however, both leadership variables were not associated with the change in job-search efficacy. Supporting Hypotheses 2a and 2b, this pattern suggests that the main route of leadership influence on member self-efficacy is an individual-level process rather than a cross-level process.

Effects of open group climate and positive group perception

As reported in the second block of Table 4, at the individual level, positive group perception was positively related to the rate of change in job-search efficacy ($\beta = 0.15$, $p < 0.001$). Open group climate also showed a positive, but marginally significant, association with the outcome ($\beta = 0.15$, $p < 0.06$). The fourth block of the HLM model showed that open group climate aggregated at the group level significantly predicted the rate of change in job-search efficacy ($\gamma = 0.57$, $p < 0.001$). Overall, the present results support Hypotheses 3a and 3b, showing that group-related variables affect members' self-efficacy through both individual- and cross-level processes.

Discussion

The present study investigated the influence of group characteristics on individual members' self-efficacy beliefs. While previous studies have identified personal and task-related determinants of self-efficacy (Gist, 1992), potential impacts of social contexts have not yet been systematically investigated. This study offers preliminary evidence that various group factors contribute to changes in members' self-efficacy in the domain of job search. The results suggest that the mechanism of group influence on changes in members' self-efficacy involves multiple pathways, including both individual- and cross-level processes. Moreover, our results suggest that different group stimuli (discretionary versus ambient) influence this individual outcome through different pathways. Below we discuss the meaning and implications of our findings.

Differential impacts of diversity

We expected that diversity in various social characteristics would expose the workshop participants to a rich array of alternative job-search methods and skills (Kuhn & Skuterud, 2000; Ports, 1993), which, in turn, would increase their job-search efficacy. Of the four attributes examined, however, only diversity in education was positively associated with increases in job-search efficacy. In the present setting, therefore, heterogeneity in education among workshop participants could be a source of diverse information and in-depth understanding of job markets and job search strategies.

The insignificant results for age, gender, and race diversity might be due to a counterbalancing function these characteristics perform in group settings. Prior studies have shown that while diversity in these 'visible' characteristics engenders creative problem solving, it also tends to increase communication difficulty and conflict (Chatman et al., 1998; Nemeth, 1986). Thus, it takes time (at least several weeks) before the group and its members can overcome this process disruption and benefit from this type of diversity (Chatman & Flynn, 2001). In the current empirical context of 5-day workshop groups, participants may not have had enough time for social development and, as a result, may have experienced difficulty in communicating various job-search strategies and ideas. This speculation, however, should be further investigated using real work groups over a longer period of time.

Leadership variables as discretionary group stimuli

The present findings offer empirical support for Hackman's (1992) distinction between ambient (group-prevailing) and discretionary (member-specific) stimuli. As expected, supportive leadership

was positively related to increases in job-search efficacy subsequent to the group workshop. This influence process, however, occurred only at the individual level, without any observed cross-level effect. This pattern suggests that leader influence on individuals is largely based on individual-level processes based on member-specific relationships with the leader (Graen & Scandura, 1987).

The present results, however, do not rule out the possibility that leadership has group-level or even organizational-level effects on outcomes such as decision quality, unit production, and financial performance of the company (Waldman, Ramirez, House, & Puranam, 2001). Nevertheless, when the outcome measure is specified at the individual level, as in the case of individual self-efficacy, leadership variables may operate only at the individual level of analysis. This finding is consistent with the leader–member exchange theory (Graen & Scandura, 1987). Based on their multi-level study of transformational leadership, Yammarino and Dubinsky (1994) concluded that 'the [leadership] theory held only at the individual level of analysis' (p. 792). These findings and the present results raise the question of boundary conditions, particularly levels of analysis, for leadership theories.

Group variables as ambient group stimuli

As we hypothesized, group characteristic variables (open group climate and positive group perception) influenced the change in job-search efficacy through both individual-level and cross-level processes. This finding suggests that the influence of ambient stimuli on individuals uses a different mechanism than that of discretionary stimuli. It also supports the proposition that some group-level phenomena possess collective properties that cannot be captured at the individual level of analysis (e.g., Hinsz et al., 1997; Weick & Roberts, 1993). Of the two group characteristics, the effect of positive group perception was limited to the individual level, whereas the effect of open group climate was largely realized at the group level (with a marginally significant effect at the individual level). This pattern implies that even among variables from the same category, their mechanisms for influencing individual behavior or attitude can vary substantially. Further theoretical development and empirical efforts are needed to clarify what specific properties of the group factors prescribe their main routes of influence on individual outcomes.

Limitations and Directions for Future Research

The results of this study should be interpreted with some caution due to several limitations. First, the groups in our sample were temporary training groups that interacted over a period of 5 days. Although the group interaction was natural and involved a significant goal for each participant (increasing job-search skills for the unemployed participants), the dynamics of these groups may differ from those of long-standing work teams whose members share a 'group goal' and work toward it. In a similar vein, the 'leaders' in the present research context were trainers who instructed participants and facilitated group activities, rather than managers or team leaders who exerted influence over day-to-day operations of group members. While the trainers in the present context might have some control over group activities, they may develop different leader–member dynamics with the participants than those held by managers or team leaders. Thus, while the present findings have some implications for work groups, they are only indicative of potential patterns that might occur in other social settings.

Second, the $T2$ measure of job-search efficacy might reflect inflated self-assessment of efficacy subsequent to a 5-day group workshop filled with substantial social support. In addition, this $T2$ measure

is subject to bias from social desirability, given that the workshop was free of charge and participants might have felt that they needed to reciprocate the trainers' efforts with positively biased responses to the questionnaire (Podsakoff & Organ, 1986). Although the $T2$ measure of job-search efficacy may not be completely free of these problems, our analysis of follow-up data suggests that the $T2$ efficacy measure was a relatively unbiased indicator of actual level of job-search skills and accompanying job-search efficacy after the workshop.[2]

Finally, we did not measure some of the key group process variables that might be directly related to changes in job-search efficacy, such as coaching or feedback from trainers or peer members, characteristics of group tasks, and discussion patterns within the group. Future research should include these variables to reveal the processes that mediate the effect of membership diversity on changes in self-efficacy and provide a deeper understanding of the link between various group processes and individual outcomes.

Despite these limitations, this study significantly extends the literature by examining social processes that might shape individuals' self-efficacy beliefs. In addition, the present findings have some implications for individual learning in a group setting, because changes in self-efficacy have been found to be a significant predictor of behavioral change and to mediate the relationship between learning and performance (Wang & Netemeyer, 2002). In general, scholars agree that learning is a social (Brown & Duguid, 1991), context-dependent process and that the group may be a rich context for individual learning (Edmondson, 1999). However, empirical investigation into how group factors shape individual learning processes and outcomes has not yet been carried out. Given that increased self-efficacy is an intermediate outcome of individual learning, the present findings may offer some insight into how individual learning occurs in a group. In this regard, further investigation might expand the present study by investigating work teams in organizational settings, using direct measures of individual learning.

The present study also suggests that influence flowing from the group to the individual is of as much interest as that flowing from the individual to the group. The group literature has mainly focused on mechanisms through which members' inputs are combined to influence group-level processes and outcomes (Guzzo & Dickson, 1996). However, the other side of the coin—that is, how 'group inputs' such as group composition and processes are transformed into 'individual outputs' such as increased self-efficacy—has been less well attended to or simply assumed without systematic investigation. The present study is aimed at this important, but insufficiently investigated, function of the group. Our findings indicate that contextual influences in groups entail multiple pathways from the group to the individual. Future studies should explore the reciprocal interaction between individual and group and how this interaction leads to various individual and group outcomes.

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[2]We collected follow-up employment data from a subsample of workshop participants at 60 days, 90 days, and 180 days after workshop participation ($N = 588$, 615, and 440, respectively). We then correlated the $T1$ and $T2$ job-search efficacy measures to participants' reemployment status ($0 =$ unemployed, $1 =$ reemployed). The results of this subsample analysis showed that $T2$ job-search efficacy was a significant predictor of reemployment at 60, 90, and 180 days after the workshop ($r = 0.11$; $r = 0.11$; $r = 0.10$, all $p < 0.01$, respectively), while $T1$ efficacy measure was not ($r = 0.02$, $r = 0.04$, $r = 0.07$, all insignificant, respectively). The fact that only $T2$ job-search efficacy was a significant predictor of reemployment suggests that a meaningful change had occurred during the workshop, and that $T2$ job-search efficacy reflects positive changes that occurred subsequent to the workshop, rather than substantial social desirability effects.

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