

Enhancing Role Breadth Self-Efficacy: The Roles of Job Enrichment and Other Organizational Interventions

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Role breadth self-efficacy (RBSE) refers to employees' perceived capability of carrying out a broader and more proactive set of work tasks that extend beyond prescribed technical requirements. A newly developed scale of RBSE was internally consistent and distinct from the related concepts of proactive personality and self-esteem. In an initial cross-sectional study ($N = 580$), work design variables (job enrichment, job enlargement, and membership of improvement groups) were the key organizational predictors of RBSE. These investigations were repeated in a second cross-sectional study ($N = 622$) and extended by examining change over time ($N = 459$). The longitudinal analysis showed that increased job enrichment and increased quality of communication predicted the development of greater self-efficacy.

Many commentators have argued that to compete against low-wage countries, and to cope with rapidly changing environments, organizations need highly skilled employees who are willing and able to take on a broader role (Buchanan & McCalman, 1989; Dean & Snell, 1991; Zuboff, 1988). As Lawler (1994) described, organizations need to "develop individuals to perform in new and more complex ways" (p. 5), a requirement that is reflected in the growing emergence of concepts that focus on broader aspects of employee performance, such as organizational citizenship behavior (OCB; Organ, 1988), contextual performance (Borman & Motowidlo, 1993), proactivity (Bateman & Crant, 1993), organizational spontaneity (George & Brief, 1992), and personal initiative (Frese, Kring, Soose, & Zempel, 1996).

Effective performance of such roles requires employees who are sufficiently confident in their abilities to take on broader duties. This requirement brings to the fore the concept of self-efficacy, an increasingly important construct within organizational research (Gist & Mitchell, 1992). Self-efficacy refers to people's judgments about their capability to perform particular tasks. It "is con-

cerned not with the skills one has but with the judgments of what one can do with whatever skills one possesses" (Bandura, 1986, p. 391). Research has shown that employees who feel capable of performing particular tasks will perform them better (Barling & Beattie, 1983), will persist at them in the face of adversity (Lent, Brown, & Larkin, 1987), and will cope more effectively with change (Hill, Smith, & Mann, 1987). Self-efficacy is thus an important motivational construct that "influences individual choices, goals, emotional reactions, effort, coping and persistence" (Gist & Mitchell, 1992, p. 186).

This article focuses on employees developing a type of self-efficacy that is especially relevant given the expanded performance requirements within modern organizations: *role breadth self-efficacy*.

Role Breadth Self-Efficacy (RBSE)

RBSE concerns the extent to which people feel confident that they are able to carry out a broader and more proactive role, beyond traditional prescribed technical requirements. In this respect, RBSE differs from common conceptualizations of self-efficacy that focus on a particular technical task (such as operating a computer).

The elements that make up an expanded role will vary across jobs and companies, but some generic competencies can be discerned. One key requirement is for employees to be proactive and use their initiative (Buchanan & McCalman, 1989; Frese et al., 1996). This reliance on self-direction derives from multiple forces, such as the trend for organizations to become flatter, therefore requiring employees to manage themselves, and the high level of change within modern organizations, meaning that em-

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ployee responses cannot be prespecified but must be flexible to the situation.

A further requirement is for interpersonal skills (Parker, Mullarkey, & Jackson, 1994). Kolodny and Stjernberg (1986), for example, described how employees need "to have some experience with group decision making, some knowledge of problem-solving processes, some facility with confrontation methods and conflict management approaches, and some verbal skills" (p. 296). The need for these competencies is accentuated within modern organizations because of the greater interdependence between traditionally separate processes (Dean & Snell, 1991). Initiatives such as cellular manufacturing require employees to resolve conflicts, coordinate activities, and communicate across traditional production boundaries (Buchanan & McCalman, 1989). The self-efficacy to carry out such interpersonal tasks cannot be assumed.

There is also typically greater functional interdependence within modern organizations, resulting in the need for employees to integrate activities laterally across departments and to manage the interface between boundaries (Albers-Mohrman & Cohen, 1995). Susman and Chase (1986, p. 262), for instance, described how a strategy of faster delivery times for a greater variety of products requires cooperation between design, purchasing, production, and marketing departments. The boundary between the organization and external customers and suppliers is also increasingly blurred, with a consequent need for employees to learn to coordinate activities across this interface.

In summary, employees increasingly need to carry out a range of activities that are more proactive, interpersonal, and integrative in their nature. Illustrative tasks include solving long-term problems, designing improved procedures, setting goals and targets, resolving conflicts, presenting information to colleagues, and meeting with customers and suppliers. Role breadth self-efficacy refers to employees' belief that they are capable of performing such an array of tasks given that they are motivated to do so. Consistent with Bandura's (1982, 1986) conceptualization, the emphasis of RBSE is on people's perception that they are able to carry out these types of tasks, rather than whether they are allowed to, or do, perform them.

Differentiation From Other Constructs

RBSE is related to concepts such as contextual performance and OCB because they all concern broader aspects than performing technical tasks. However, RBSE differs from these constructs in that its focus is not on what people do (i.e., their behavior), but rather on what they feel they can do. RBSE also explicitly focuses on activities that require employees to be proactive, whereas concepts such as OCB include dimensions that are more pas-

sive in their orientation, such as compliance with procedures, punctuality, and attendance (George & Brief, 1992).

The concept of RBSE is also distinct from self-esteem. The latter is usually considered to be a global trait reflecting an individual's characteristic and affective evaluation of the self. Self-efficacy, on the other hand, is a judgment about specific task capability (Brockner, 1988), and RBSE is a judgment about capability across a particular set of tasks. Self-efficacy (and hence RBSE) is a dynamic construct that changes over time, unlike self-esteem which is seen as a stable trait (Brockner, 1988; Wood & Bandura, 1989). For example, studies have demonstrated that various training methods can enhance self-efficacy (Frayne & Latham, 1987; Gist, 1989; Gist, Schwoerer, & Rosen, 1989). By the same reasoning, the concept of RBSE is related to, but nevertheless distinct from, concepts such as proactive personality (Bateman & Crant, 1993). Whereas the latter is construed as a personal disposition, or a relatively stable tendency to effect environmental change, RBSE is expected to change in response to the environment. Thus, although employees' RBSE will partly reflect their personality (such as their self-esteem and proactivity), it will also be shaped by their organizational experiences. The rationale behind this assertion is described in more detail next.

Change in RBSE

An important research question that has not been addressed to date concerns how to facilitate a sense of RBSE. That there might be a link between RBSE and various organizational practices (such as training, the introduction of improvement groups, and job enrichment) is an unexplored but clearly viable proposition.

Bandura (1982) suggested that four categories of experience are used in the development of self-efficacy, three of which are particularly relevant here. The first is enactive mastery, or repeated performance success: "Mastery is facilitated when gradual accomplishments build the skills, coping abilities, and exposure needed for task performance" (Gist, 1987, p. 473). The second category is modeling, or vicarious experience. Efficacy is enhanced by observing role models who show effective strategies for dealing with difficult situations and raise observers' beliefs about their own capabilities. Verbal persuasion, or realistic encouragement of performance, is the third way of enhancing self-efficacy. The remaining category of experience, less relevant here, concerns judgments of physiological states. Information from all of these experiences is weighted and integrated with other information about the task (e.g., its complexity and controllability), personal factors (e.g., skill levels, motivation), and situational factors (such as the presence of distractions) to give rise to a judgment of self-efficacy (Gist & Mitchell, 1992).

Organizational practices will clearly influence the type and extent of enactive mastery, modeling, and verbal persuasion experiences that employees are exposed to. By this mechanism, such practices can affect the assessments that employees make about their performance capability. In terms of RBSE, consider an organization where jobs are simplified, training opportunities are minimal, and employee participation in decision making is limited. In such a workplace, it is reasonable to expect that most employees will have low RBSE. They are likely to have had little opportunity for successful performance in broader integrative, proactive, and interpersonal tasks; nor are they likely to have observed similar others successfully performing such tasks. Therefore, not only will employees judge these tasks as complex ones that they lack the skills to carry out, but their attribution of past experiences might lead them to feel they have little control over the determinants of their performance anyway. Such an environment can cause a vicious cycle where, even if opportunities for enactive mastery arise, employees lack the confidence to participate. As Gist (1987) suggested "in some circumstances, possibly because of fear or incapacity, individuals may not expose themselves to opportunities for enactive mastery" (p. 473).

It is possible to imagine interventions to break this cycle. Drawing on previous research that shows training can enhance self-efficacy (e.g., Gist, 1989), providing relevant training is perhaps the most obvious intervention, especially if it provides the opportunity for enactive mastery and modeling. Training in interpersonal and team working skills (e.g., conflict resolution, team building) and in problem-solving skills (such as brainstorming, causal analysis) are the types of training that are likely to be relevant to enhancing employees' confidence that they can effectively carry out a wider range of social, integrative, and proactive tasks.

Workplace communication is also likely to be an important facilitator of RBSE. Kouzes and Posner (1987) stated that, "without information, you can be certain that people will not extend themselves to take responsibility or vent their creative energies" (p. 157). Information about the direction of the organization helps people to feel capable of taking initiative (Kanter, 1983) and increases their ability to make decisions that align with organizational goals (Conger & Kanungo, 1988). Similarly, information about performance can act as a form of verbal persuasion because it is "fundamental to reinforcing a sense of competence and believing that one is a valued part of an organization" (Spreitzer, 1995, p. 1447).

A further potentially important intervention for enhancing RBSE is to redesign work so as to allow more opportunities for self-efficacy enhancing experiences. One popular form of work redesign is to introduce "improvement

groups" (variously referred to as continuous improvement teams and quality circles), in which volunteer employees meet in off-the-job teams to address local problems and to improve processes (Cordery, 1996). Involvement in such groups can expand the boundary of traditional narrow jobs, and can give employees the opportunity to try out, and experience success in, a whole range of nontechnical tasks. At the same time, members of improvement groups can observe similar others dealing with new and difficult situations (i.e., enhanced exposure to modeling experiences), and thereby increase their own belief that they can perform in this way.

Another way to restructure work that could promote greater employee RBSE is through job enlargement. This work design strategy involves increasing the breadth of activities people are involved in, such as by combining tasks previously carried out by two separate people. Whereas improvement groups are a somewhat peripheral activity engaged in by volunteer employees who meet for a designated amount of time per week, job enlargement involves expanding the day-to-day tasks people are engaged in and thus potentially provides regular and ongoing opportunities for enactive mastery.

Job enrichment is a related, and potentially even more important, work design strategy for enhancing RBSE. In contrast to enlargement (which involves expanding jobs "horizontally"), enrichment involves expanding jobs "vertically" to increase responsibility for making decisions (Hackman & Oldham, 1976). Employees have autonomy over their immediate set of tasks (such as the timing of these tasks, and the methods used) as well as greater influence over broader decisions that affect them (such as setting team goals). An enriched work design means that employees not only have the discretion to take on broader and more proactive tasks as and when required, but their motivation to do so is likely to be higher than in simplified jobs (Wall & Martin, 1987). Autonomy also means that employees are likely to feel increased personal control over their environment, and perceived control is recognized as a critical determinant of self-efficacy (Bandura, 1986; Bandura & Wood, 1989). As Gist and Mitchell (1992) described, "the more people believe that the causes of performance are uncontrollable, the lower and more resistant to change will be their self-efficacy" (p. 201).

The proposal that job enrichment is likely to facilitate RBSE is supported by case study evidence. Buchanan and McCalman (1989), for example, described how employees developed a stronger sense of self-efficacy after the introduction of autonomous work groups. Illustrative comments made by these employees were "it has made me do things that I thought I was not capable of doing" and "it has given me confidence in my own ability to learn new skills." In a related vein, many commentators

have observed that low-discretion jobs can lead to employees experiencing a sense of learned helplessness (Argyris, 1964; Brousseau, 1983; Karasek & Theorell, 1990). Studies suggest that this passive state can be reversed by enhancing job autonomy (e.g., Frese et al., 1996; Kohn & Schooler, 1978; Parker, Wall, & Jackson, 1997).

In summary, although there are few empirical studies to draw on, it is highly plausible to propose that RBSE will be facilitated by organizational practices. Relevant training, communication, improvement groups, job enlargement, and job enrichment all potentially provide employees with opportunities for enactive mastery, modeling, and/or verbal persuasion experiences in a range of broad, proactive, and integrative tasks.

The Present Article

In this article, I report on two field studies conducted in separate companies that test the research proposition. The first study was based on cross-sectional data. The existence of a cross-sectional association between organizational practices and RBSE is a necessary condition to demonstrate that the former influences the latter. Nevertheless, a cross-sectional association is insufficient on its own because the relationships could be accounted for by the reverse causal pathway (e.g., those with higher RBSE might be more likely to volunteer to participate in an improvement group). Indeed, it has been argued that a reciprocal relationship between self-efficacy and organizational experiences is most likely (Bandura, 1986). A longitudinal study is required to differentiate how organizational practices influence RBSE from the way that RBSE influences perceptions of organizational experiences. The second study therefore included a longitudinal component.

Study 1

Background, Aims, and Hypotheses

The study was conducted within a company that, under the direction of a new management team, had introduced various initiatives to enhance its competitiveness. To improve communication, senior management had introduced a briefing system in which employees met with their supervisor on a regular basis. The briefings were a mechanism by which strategic information could be cascaded down, as well as an opportunity for employees to discuss local issues. As part of a drive to improve product quality, a major initiative introduced by the company was the implementation of continuous improvement groups. The groups, composed of volunteer employees, met once a week to deal with problems and to continuously improve processes in their area. At the same time as this initiative

was being introduced, senior management began to promote the philosophy of empowerment. Supervisors were encouraged to devolve responsibility and autonomy to employees (job enrichment), and to implement cross-training schemes to enhance employee flexibility (job enlargement).

All of these initiatives have the potential to enhance RBSE, as described earlier. To the extent that they have been successful, therefore, employees are likely to report greater levels of self-efficacy. The hypotheses are as follows:

Hypothesis 1. The extent of communication briefs will be positively associated with RBSE, and will make an independent contribution to its prediction.

Hypothesis 2. Membership of improvement groups will be positively associated with RBSE, and will make an independent contribution to its prediction.

Hypothesis 3. The perceived extent of job enlargement (i.e., the degree of task variety) will be positively associated with RBSE, and will make an independent contribution to its prediction.

Hypothesis 4. The perceived extent of job enrichment (i.e., the degree of task autonomy and decision-making influence) will be positively associated with RBSE, and will make an independent contribution to its prediction.

For those employees in improvement teams, an additional analysis was conducted to explore the direction of causality. If being involved in an improvement group facilitates the development of self-efficacy, rather than the relationship simply reflecting the reverse causal pathway (i.e., employees with high RBSE self-selecting into groups), then the amount of opportunity for involvement afforded within the team should predict self-efficacy. An additional hypothesis therefore is as follows:

Hypothesis 5. For those employees who are members of an improvement group, the perceived amount of opportunity for involvement within the group will have a positive association with RBSE.

Before testing these hypotheses, however, an initial requirement was the development of a reliable and valid measure of RBSE because one does not currently exist. Following the development of a set of appropriate items, I investigated their discriminant validity from items assessing two related constructs (self-esteem and proactive personality), using confirmatory factor analysis (CFA; Jöreskog & Sörbom, 1988). To further investigate construct validity, I compared scores on RBSE for members of different occupational groups. I report on the findings for these analyses prior to presenting tests of the hypotheses.

Method

Procedure and Sample

Participants completed questionnaires during work hours in group sessions facilitated by researchers. Confidentiality was emphasized. The response rate was over 75%.

The sample included 669 employees from a glass manufacturing company. Respondents ranged from 18 to 69 years of age ($M = 38.57, SD = 11.19$), with the tenure ranging from less than 1 year to 41 years ($M = 12.06, SD = 9.26$). One third of the respondents were women, and 3% had temporary rather than permanent employment contracts.

Measures

Biographical information. Each respondent indicated their age (in years), tenure (in years), gender (*male* = 1, *female* = 0), employment status (*permanent* = 1, *temporary* = 0), and job title. Job titles were used to classify employees into five occupational groups: supervisors and managers, white collar professionals (e.g., sales and marketing personnel), clerical and administration, shopfloor, and other (i.e., those who did not indicate their job title on the questionnaire). For the regression analyses, occupational group membership was coded using dummy variables.

RBSE. Self-efficacy is typically operationalized in precise task-specific terms (Gist, 1987). For the current purpose, it was appropriate to assess self-efficacy by averaging scores across a set of tasks rather than using the score from a single task. To identify the set of tasks, I interviewed a cross-section of staff and asked them to describe nontechnical activities they felt were increasingly important for them to engage in to be effective. There were approximately 20 tasks involving proactive, interpersonal, and integrative competencies that were frequently mentioned. Of those, I selected the 10 that I judged to be the most generalizable to other organizations (see Table 1 for the item content). The set of tasks was not intended to be exhaustive; the aim was to represent important exemplar elements of an

expanded role that apply across jobs and hierarchical levels. This approach is consistent with Gist's (1987) suggestion that a more generalized self-efficacy measure could be constructed by aggregating self-efficacy scores across known performance competencies. (Note that, in operational terms, there is no reason to expect a distinction between tasks that involve proactive, interpersonal, or integrative competencies because these overlap a great deal. For example, setting goals is a proactive process that is likely to require interpersonal and integrative activities. The main point is that all of the tasks involve competencies that extend beyond technical ones.)

Respondents were asked to rate how confident they would feel if they were asked to carry out each of the 10 tasks using a 5-point Likert scale from 1 (*not at all confident*) to 5 (*very confident*). This method differs from the one developed by Bandura that involves asking people if they can perform at specific levels on a task (by asking them to indicate "yes" or "no"), and then asking for degree of confidence in that endorsement. Bandura's (1986) approach, although recommended on the basis of an empirical evaluation (Lee & Bobko, 1994), was not appropriate here as it was not possible to obtain a set of tasks that all employees would have had an opportunity to perform. What was of interest here was people's belief in their capability to perform such a task if it were asked of them, not whether they had actually carried out the particular task. Thus, a Likert scale was considered more appropriate (note that two recent studies have shown convergence between a Likert scale method and Bandura's (1986) method, with additional predictive validity for the former; Maurer & Pierce, 1998; Mudgett & Quinones, 1997).

Scores from the 10 items were summed to form a single scale, and Cronbach's (1951) alpha was .96.

Self-esteem. Six items from Rosenberg's (1965) self-esteem scale were used to assess this aspect, such as "I feel I have a number of good qualities" and "I haven't got much to be proud of" (reverse scored). The response scale ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alpha was .78.

Table 1
Role Breadth Self-Efficacy Items and Their Standardized Coefficients From the Three-Factor CFA Model, Means, and Standard Deviations (Study 1, N = 608)

Item ("How confident would you feel?")	Standardized coefficients	<i>M</i>	<i>SD</i>
Analyzing a long-term problem to find a solution	.88	2.81	1.26
Representing your work area in meetings with senior management	.87	2.51	1.40
Designing new procedures for your work area	.87	2.74	1.28
Making suggestions to management about ways to improve the working of your section	.85	2.84	1.29
Contributing to discussions about the company's strategy	.85	2.33	1.26
Writing a proposal to spend money in your work area	.85	2.56	1.35
Helping to set targets/goals in your work area	.81	2.86	1.23
Contacting people outside the company (e.g., suppliers, customers) to discuss problems	.81	2.57	1.47
Presenting information to a group of colleagues	.76	2.65	1.28
Visiting people from other departments to suggest doing things differently	.68	2.70	1.26

Note. CFA = confirmatory factor analysis.

Proactive personality. This concept was assessed by six of the highest-loading items in Bateman and Crant's (1993) scale designed to assess personal disposition toward proactive behavior (defined as the relatively stable tendency to effect environmental change). The items were "If I see something I don't like, I fix it," "No matter what the odds, if I believe in something I will make it happen," "I love being a champion for my ideas, even against others' opposition," "I am always looking for better ways to do things," "If I believe in an idea, no obstacle will prevent me from making it happen," and "I excel at identifying opportunities." The response scale ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Cronbach's alpha was .85.

Extent of communication briefs. Respondents indicated how often they had regular communication briefings (*less than once a month* = 0, *approximately once or twice a month* = 1, *approximately once a week* = 2, *more than once a week* = 3).

Membership of improvement groups. Respondents indicated whether they were currently in a continuous improvement team (*yes* = 1, *no* = 0).

Opportunity for involvement within improvement groups. Members of teams indicated the extent that they "have say over important decisions" and "are encouraged to contribute ideas" on a response scale from 1 (*not at all*) to 5 (*a great deal*). Cronbach's alpha was .73.

Job enlargement. Employees indicated the extent that they: "do a range of different things," "make full use of their skills," and "use a variety of skills" on a response scale from 1 (*not at all*) to 5 (*a great deal*). Cronbach's alpha was .81.

Job enrichment. Job enrichment was assessed by two measures that assessed related, but distinct, components of job enrichment. To assess employees' autonomy over their immediate tasks, I used a measure of task control developed by Jackson, Wall, Martin, and Davids (1993; see also Wall, Jackson, & Mullarkey, 1995). Items were combined from two subscales: timing control (i.e., control over work pace and scheduling) and method control (i.e., choice in how to carry out work tasks). Cronbach's alpha was .94. To assess the second aspect of job enrichment, influence over wider decision-making, I used a measure of decision-making influence. This 4-item scale assessed the extent that respondents felt able to influence decisions such as those concerning changes that affect their work, departmental goals, and plans for their area. Cronbach's alpha was .87. The response scale for items in both scales went from 1 (*not at all*) to 5 (*a great deal*).

Analyses and Results for Scale Development

To determine whether the RBSE items assessed a construct that was internally consistent, and that was distinct from the related constructs of proactive personality and self-esteem, I carried out a CFA to test models of increasing complexity. All RBSE items, proactive personality items, and self-esteem items were included in the analysis. The baseline was a null model with zero covariances between items (Bentler & Bonett, 1980). Additional models that were tested included a one-factor model, in case the items could be subsumed under a single construct; a two-

factor model, with RBSE and self-esteem as one factor and proactive behavior as another; a second two-factor model, with RBSE and proactive behavior as one factor and self-esteem as the other; and a three-factor model, with one factor for each scale. The sample used was the 608 participants who had no missing data for any item.

The overall fit of a measurement model to the data has most often been tested using the chi-square test statistic. A large value of chi-square indicates that the model does not adequately fit the data, whereas a chi-square ratio (i.e., chi-square divided by degrees of freedom) of around five is taken as a useful rule of thumb for accepting a model (Jackson et al., 1993). However, because both indices are inflated by sample size, Bentler and Bonett (1980) proposed a nonnormed fit index (NNFI) that compares the fit of a model with that of a null model, taking into account the number of degrees of freedom in moving from one to another. More recently, Bentler (1990) proposed the comparative fit index (CFI).

The null model was a poor fit to the data, $\chi^2(231, N = 608) = 8,543.68$, as was the one-factor model, $\chi^2(209, N = 608) = 2,662.97$ (ratio = 12.74, NNFI = .69, CFI = .70). The first two-factor model was an improvement, but still not a close fit, $\chi^2(208, N = 608) = 1,683.37$ (ratio = 8.09, NNFI = .80, CFI = .82). The second two-factor model was also not a good fit, $\chi^2(208, N = 608) = 2,020.20$ (ratio = 9.71, NNFI = .76, CFI = .78). The three-factor model was a close fit to the data, $\chi^2(206, N = 608) = 993.09$ (ratio = 4.82, NNFI = .89, CFI = .90), and was a significantly better fit than the first two-factor model, $\Delta\chi^2(2, N = 608) = 690.28, p < .001$, and the second two-factor model, $\Delta\chi^2(2, N = 608) = 1,927.11, p < .001$. In the three-factor model, factor-loading estimates for all of the items were significant at the .001 level and were greater than .45. Table 1 shows the standardized coefficients from the three-factor model for the RBSE items, as well as the item means and standard deviations.

The CFA results show that the RBSE items were assessing a different construct than the proactive personality and self-esteem items, and that the self-efficacy items were related to each other. It was thus appropriate to sum the self-efficacy items together to form a scale.

To further check the construct validity of the scale, I investigated whether RBSE discriminated between broad occupational categories. A minimum criterion for the validity of the measure is that it should differentiate employees in jobs that are more likely to involve proactive, interpersonal, and integrative tasks (such as those in managerial or professional positions) from those in jobs that are less likely to involve such tasks (such as low-level shopfloor and clerical-administration positions). These occupational groups not only vary in their job requirements, but members of the former group, particularly the

managers, are likely to have been selected on the basis of broad, proactive, and integrative skills.

Supervisors and managers reported the highest levels of RBSE ($M = 3.92, SD = 0.88$), followed by white collar professionals ($M = 3.27, SD = 0.97$), clerical and administration staff ($M = 2.84, SD = 1.09$), shopfloor employees ($M = 2.44, SD = 1.02$), and others ($M = 2.23, SD = 0.89$). A one-way analysis of variance showed that these differences in RBSE were significant, $F(4, 664) = 44.18, p < .001$. Specifically, a planned comparison showed that, as expected, the combined group of shop-floor employees and clerical-administration had significantly lower RBSE scores than supervisors-managers and professionals, $t(664) = 7.21, p < .001$. These occupational differences were consistent with a priori expectations, providing further evidence of the scale's validity.

Analyses and Results for Tests of Hypotheses

I predicted that the following organizational practices would make a positive and independent contribution to the prediction of RBSE: the extent of communication briefs (Hypothesis 1), membership of improvement groups (Hypothesis 2), the degree of job enlargement (Hypothesis 3), and the degree of job enrichment (Hypothesis 4).

To test these hypotheses within a single analysis, a hierarchical regression technique was used to enable the entry of specific blocks of variables in order of priority. The first block of variables to be entered was the background variables, including age, tenure, gender, employment status, and occupational status (dummy coded). Entering the background variables first effectively holds constant any influence that these factors have on RBSE. The second block of variables to be entered were the variables assessing self-esteem and proactive personality. This meant that the effect of these personality factors was partialled out, providing a more stringent test of the association between organizational features and RBSE. The final block of variables to be entered included communication briefs, membership of improvement groups, job enlargement, task control, and decision-making influence. Change in R^2 , a measure of effect size, was estimated at each step to indicate whether the set of variables contributes to the prediction of self-efficacy scores over and above previous steps. Standardized beta weights for the final regression equation, which indicate the relative importance of the predictor variables, are also shown. Because of moderate-sized intercorrelations between predictor variables, squared semipartial correlations were also computed for each variable to show their independent contributions, as recommended by Tabachnick and Fidell (1989). An alpha level of .05 was used for all statistical tests. Because the direction of effect was specified, one-tailed tests were used to assess the significance of the hypothesized relationships.

Table 2
Intercorrelations Between Major Variables in Study 1 ($N = 669$)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Role breadth self-efficacy	2.68	1.10	—															
2. Shopfloor employee group	0.56	0.50	-.19***	—														
3. Management-supervisory group	0.11	0.31	.42***	-.39***	—													
4. Professional group	0.05	0.22	.14***	-.26***	-.08*	—												
5. Clerical-administration group	0.05	0.22	.04	-.26***	-.08*	-.05	—											
6. Age	38.57	11.19	.04	-.05	.07	-.00	-.09*	—										
7. Gender	0.67	0.48	.22***	.07	.10*	-.01	-.25***	.26***	—									
8. Tenure	12.06	9.26	.07	-.03	.09*	-.05	-.05	.57***	.15***	—								
9. Employment status (permanent)	0.97	0.17	.09*	-.03	.06	-.04	-.04	.02	-.00	.18***	—							
10. Self-esteem	4.20	0.56	.29***	.03	.11**	.01	.04	-.02	.06	.02	.10**	—						
11. Proactivity	3.39	0.64	.44***	-.06	.19**	.07	-.10**	.13**	.18***	.11**	.04	.31***	—					
12. Communication briefs	0.43	0.61	.11**	-.08*	.12**	.00	.01	.03	-.02	-.01	.01	.06	.13***	—				
13. Membership of group	0.32	0.47	.29***	-.22***	.31***	.06	.08*	.06	.11**	.07	.07	.08*	.19***	.10**	—			
14. Job enlargement	3.57	0.95	.31***	-.06	.16***	.03	-.05	.02	.11**	.11**	.04	.18***	.23***	.15***	.09*	—		
15. Task control	3.10	1.15	.49***	-.27***	.31***	.16***	.15***	.00	.14***	.07	.04	.18***	.23***	.09*	.21***	.38***	—	
16. Decision-making influence	2.44	1.07	.44***	-.24***	.34***	.09*	.04	-.03	.11**	.01	.05	.12***	.27***	.15***	.28***	.41***	.70***	—

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2 shows zero-order correlations between the main variables. As expected, RBSE had statistically significant positive correlations with all of the organizational variables: task control ($r = .49, p < .001$), decision-making influence ($r = .44, p < .001$), job enlargement ($r = .31, p < .001$), membership of improvement groups ($r = .29, p < .001$), and communication briefs ($r = .11, p < .01$). It is also important to observe that although there were no significant correlations between age or tenure and RBSE, gender had a statistically significant correlation with the dependent variable ($r = .22, p < .001$). The mean RBSE was 2.29 ($SD = 1.00$) for women compared to 2.64 ($SD = 1.10$) for men. Employment status was also significant correlated with RBSE ($r = .09, p < .05$). The mean RBSE for the 20 employees on temporary contracts was 2.10 ($SD = 0.85$) and the mean for those on permanent contracts was 2.66 ($SD = 1.10$).

Table 3 shows results of the regression analysis. The smaller sample size than that used for either the CFA or the zero-order correlations reflects the fact that many participants chose not to respond to the biographical questions (which were included in the regression analysis) to protect their anonymity.

Focusing on Step 3, the entry of the organizational variables made a significant incremental contribution to the regression equation, as expected, accounting for an additional 7% of the variance in RBSE scores ($\Delta R^2 =$

.07, $p < .001$). Inspection of the beta weights in the final regression equation shows that all of the hypotheses except Hypothesis 1 were supported (note that the order of importance of organizational predictors based on beta weights was consistent with that obtained from inspecting squared semipartial correlations). In support of Hypotheses 2 and 3, respectively, membership of improvement groups and job enlargement each had a significant beta weight ($\beta = .07, p < .01$; $\beta = .11, p < .001$). Task control, one of the measures of job enrichment, was a significant predictor of RBSE ($\beta = .19, p < .001$), supporting Hypothesis 4. Decision-making influence (the second measure of job enrichment) did not make a significant independent contribution to the regression equation, although this is likely to be because of its high correlation with task control. When task control was left out of the regression analysis, decision-making influence was a significant predictor of RBSE.

Contrary to Hypothesis 1, the extent of communication briefs did not have a significant beta weight in the final regression equation, despite its significant zero-order association with RBSE. This result suggests that communication briefs shares variance with the background or personality factors entered in previous steps, or that it shares variance with other more important organizational predictors, or both. A separate regression analysis with only communication briefs included in Step 2 gave weight to the former of these explanations. That is, with all of the other organizational practices left out of the regression equation, communication briefs did not have a significant beta weight once the influence of the background and personality variables had been statistically partialled out.

To test Hypothesis 5, a hierarchical regression analysis was conducted using the 179 employees who were members of improvement groups. Results showed that, after entering the background and personality variables, the perceived amount of opportunity for involvement within the group made a significant incremental contribution to the regression equation ($\Delta R^2 = .08, p < .001$). The beta value of this variable in the final regression equation was high ($\beta = .34, p < .001$), and its direction was entirely consistent with that proposed: The greater the opportunity for involvement (i.e., the more say over decisions and encouragement to put forward ideas) the greater the RBSE of group members.

In addition to tests of the specific hypotheses, it is relevant to observe that both self-esteem and proactive personality were significant predictors of RBSE ($\beta = .11, p < .01$, and $\beta = .24, p < .001$, respectively), suggesting that these personality factors are associated with self-efficacy. It is also worth noting that gender was a significant predictor of RBSE when it was entered into the regression equation with the other background variables ($\beta = .13, p < .001$). The direction of the beta weight indi-

Table 3
Summary of Hierarchical Regression Analysis for Variables Predicting RBSE (Study 1, $N = 580$)

Step and predictor	1	2	3
1. Background factors			
Shopfloor employees	.07	.09	.09
Manager-supervisors	.47***	.40***	.31***
Professional staff	.20***	.18***	.15***
Clerical-administration	.18***	.18***	.13***
Age	-.02	-.02	.00
Gender	.19***	.19***	.13***
Tenure	-.02	-.02	-.05
Employment status	.06	.06	.05
2. Personality variables			
Self-esteem		.13***	.11**
Proactivity		.30***	.24***
3. Organizational variables			
Communication briefs			.00
Membership of group			.07**
Job enlargement			.11***
Task control			.19***
Decision-making influence			.05
R^2	.29***	.40***	.47***
Adjusted R^2	.27	.39	.46
ΔR^2		.11***	.07**

Note. The displayed coefficients are standardized beta weights at each step. One-tailed tests of the statistical significance of beta weights were used for variables entered in Step 3. RBSE = role breadth self-efficacy. ** $p < .01$. *** $p < .001$.

cates that men were more likely to report higher levels of self-efficacy than women. Consistent with this, an analysis of covariance (with the other background variables as covariates) showed that women had significantly lower RBSE than men, $F(1, 628) = 34.56, p < .001$.

Study 1 Summary

In support of the research proposition, this study showed a clear association between RBSE and organizational practices (membership of improvement groups, job enlargement, and job enrichment), even after the effects of proactive personality and self-esteem were partialled out. The extent of communication briefs did not make a significant independent contribution to the prediction of RBSE. However, this could be because the importance of communication lies not so much in the frequency of information dissemination, but concerns the extent that employees feel listened to and encouraged to put forward their views (i.e., the degree of two-way communication). In other words, the quality of communication might be a more important determinant of self-efficacy than simply the quantity.

At this point, although the results show relationships between RBSE and various organizational factors, the causality of the associations has not been investigated. For example, it is possible that the relationship between improvement group membership and RBSE reflects the association of both of these variables with a relatively stable unmeasured third factor, such as ambitious personality style. A longitudinal analysis lessens the likelihood of this possibility (although note that it does not allow one to rule out the possibility of spurious correlations or the influence of completely unstable unmeasured third variables). The next study thus addressed the question, does change in organizational practice affect change in RBSE? The study also extended the current one in two further ways: It included an assessment of the quality, not just the quantity, of communication, and it considered the relationship between RBSE and relevant training.

Study 2

Background, Aims, and Hypotheses

The study was conducted in a family-owned company in the United Kingdom that manufactures and assembles large vehicles. In response to feedback that the primary customer was losing confidence in the vehicles, management introduced a wide-ranging program to improve quality. At the time of the first survey, the following initiatives relevant to this study had been at least partially implemented: regular communication briefs, continuous improvement groups, job enlargement, and job enrichment. Approximately two thirds of the participants, for example,

were involved in an improvement group at this time. Hypotheses 1–5 outlined for Study 1 thus stand, although the first hypothesis is extended to include not only the relationship between the extent of communication briefs and RBSE (Hypothesis 1a) but also that between the quality of communication and RBSE (Hypothesis 1b).

In addition, the company had implemented a major training program that included two courses considered necessary for working in a continuous improvement environment: training in improvement techniques (e.g., problem-solving activities), and training in cost awareness. At the time of the first survey, over 70% of the sample had attended at least one of these courses. Research evidence described earlier has shown that relevant training can facilitate personal efficacy beliefs. In regard to RBSE, because of the proactive and integrative emphasis of courses involving topics such as costs and improvement, one would expect attendance at them to promote greater self-efficacy. Establishing whether such a link exists is important, not least because of the increasing popularity of training in generalized competencies such as problem solving. One could also hypothesize that the degree of technical training in core tasks will enhance RBSE by increasing employees' overall confidence in their abilities. Unfortunately, it was not possible to obtain an accurate assessment of the degree of technical training. The current hypothesis is therefore a more focused one:

Hypothesis 6. The degree of relevant training (i.e., training in improvement techniques and cost awareness) will be positively associated with RBSE, and will make an independent contribution to its prediction.

Eighteen months after the initial survey, participants completed the questionnaire for a second time. By this stage, further change had taken place. The site was taken over by an American-owned multinational company whose managers had an approach that contrasted sharply with the previous management style. Initiatives were introduced that had mixed effects on job design. For some employees, levels of task control and decision-making influence increased (e.g., as a result of moving the planning function to the site), whereas for others, the degree of job enrichment declined (e.g., due to the installation of moving assembly lines).

Moreover, rather than more people becoming involved in improvement groups, many people dropped out or became less involved over time. In part, this trend reflects the tendency for improvement groups to have a limited life, but it also reflects the particular approach of the takeover company. By the time of the second survey, well over two thirds of the sample (75%) were not involved in any type of improvement group. This latter situation meant that the longitudinal investigation was only a partial one, because it was not possible to test the effect on RBSE

of joining an improvement group but only the effect of leaving one. Thus, although the longitudinal test is important, it is incomplete and a cross-sectional analysis on this sample is useful in its own right. In the first part of this study, therefore, I examine the hypotheses using cross-sectional data. In the second part, I present results of the longitudinal analyses predicting change in RBSE.

Method

Procedure

Participants completed two questionnaires separated by 18 months. Questionnaires were administered during work time in group sessions facilitated by the researchers. The response rate on each occasion was over 80%.

Samples

The cross-sectional sample at Time 1 included 622 participants whose ages ranged from 16 to 63 years ($M = 38.07$, $SD = 10.40$) and whose tenure ranged from less than 1 year to 22 years ($M = 8.08$, $SD = 6.98$). Six percent of participants were female, and 20% had temporary employment contracts.

At Time 2, there were 778 participants who completed a questionnaire (the increased sample size compared to Time 1 was due to an expansion of the workforce to cope with a greater worldwide demand for products). Of these, 459 participants had also completed the previous survey and it is this matched sample that was used for the longitudinal component. Respondents in the matched sample ranged from 18 to 64 years of age ($M = 39.58$, $SD = 10.27$), with a tenure ranging from 18 months to 25 years ($M = 9.80$, $SD = 6.89$). Five percent of the sample were women, and 1% had temporary employment contracts.

Measures

The same items as described in Study 1 were used to assess RBSE. A CFA based on the RBSE items suggested that a one-factor model was a reasonable fit to the data, $\chi^2(35, N = 677) = 420.10$ (ratio = 12.00, NNFI = .91, CFI = .93), and that the null model with zero covariances between items was a poor fit, $\chi^2(45, N = 677) = 5,469.91$. Inspection of the residuals from the one-factor model suggested the presence of shared variance between pairs of items: Items 6 and 7 both refer to "your work area," and Items 2 and 4 both refer to "management." The final model to be fitted captured this commonality. The improvement in chi-square resulting from the addition of the two correlated errors was substantial, $\Delta\chi^2(2, N = 677) = 133.04$, $p < .001$, and the fit values for this final model were high (NNFI = .94, CFI = .95).

For each item, the means and standard deviations, listed in the same order as in Table 1, were as follows: 3.31 ($SD = 1.15$), 2.86 (1.34), 3.32 (1.08), 3.19 (1.17), 2.63 (1.22), 2.91 (1.30), 3.31 (1.15), 3.03 (1.33), 2.97 (1.27), and 3.27 (1.17). Cronbach's alpha coefficient for the RBSE items was .95 at Time 1 and .96 at Time 2.

Change in RBSE, the dependent variable in the longitudinal

analysis, was assessed by subtracting Time 1 RBSE scores from Time 2 RBSE scores.

The same measures as described in Study 1 were used to obtain the following: biographical information, opportunity for involvement within improvement groups ($\alpha = .74$), job enlargement ($\alpha = .75$), task control ($\alpha = .87$), and decision-making influence ($\alpha = .87$). The same measures were also used to assess Time 2 job enlargement ($\alpha = .82$), Time 2 task control ($\alpha = .88$), and Time 2 decision-making influence ($\alpha = .88$).

Extent of communication briefs. Respondents indicated how often they had regular communication briefings (*less than once a month = 1, approximately once a month = 2, approximately once a fortnight = 3, approximately once a week = 4, and more than once a week = 5*). Time 2 extent of communication briefs was assessed in the same way.

Communication adequacy. Nine items assessed the extent to which respondents feel they are informed about various aspects of their work, they are listened to by their supervisor, and they are encouraged to inform others. Time 2 communication quality was assessed in the same way. Cronbach's alphas at Time 1 and Time 2 were .88 and .86, respectively.

Membership of improvement groups. Respondents indicated whether they were currently a member of a departmental improvement group (*yes = 1, no = 0*) or an across-department group (*yes = 1, no = 0*), and scores on these items were summed. Time 2 membership of improvement groups was computed in the same way.

Relevant training. Participants indicated whether they had received improvement training (*yes = 1, no = 0*), and whether they had attended cost-awareness training (*yes = 1, no = 0*). Scores for these items were summed.

By the time of the second survey, employees had also been given an opportunity to attend a training course that involved activities designed to enhance collective working skills and ownership of team goals. Employees were asked whether they had attended this teamwork training (*yes = 1, no = 0*), as well as whether they had received training in improvement techniques (*yes = 1, no = 0*) and cost awareness (*yes = 1, no = 0*) because both of the latter courses continued to run over the period. The combined score on the three items was the measure of Time 2 relevant training.

Cross-Sectional Analyses and Results

Table 4 shows zero-order intercorrelations between the key variables at Time 1 and Time 2. Consistent with Hypotheses 1–4, RBSE had statistically significant positive correlations with all of the organizational variables at both Time 1 and Time 2. At Time 1, its strongest associations were with the work design variables: decision-making influence ($r = .41$, $p < .001$), task control ($r = .32$, $p < .001$), job enlargement ($r = .27$, $p < .001$), and membership of improvement groups ($r = .25$, $p < .001$). Relevant training had the next strongest association with RBSE ($r = .19$, $p < .001$), followed by communication quality ($r = .13$, $p < .001$) and communication briefs ($r = .08$, $p < .05$). The size and patterns of correlations

Table 4
Intercorrelations Between Major Variables in Study 2 at Time 1 (N = 622) and at Time 2 (N = 778)

Variable	Time 1		Time 2		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	M	SD	M	SD																
1. Role breadth self-efficacy	3.08	1.01	3.03	1.05	—	-.37***	.29***	.02	.21***	.17***	.02	.16***	.17***	.08*	.13***	.25***	.24***	.32***	.41***	.19***
2. Shopfloor employee group	0.72	0.45	0.73	0.44	-.37***	—	-.39***	-.39***	-.56***	-.16***	.32***	-.21***	-.15***	-.03	-.03	-.20***	-.23***	-.35***	-.29***	-.20***
3. Management-supervisory group	0.05	0.22	0.05	0.22	.30***	-.37***	—	-.06	-.09*	.08*	.00	.08*	.12**	.09*	.14***	.11**	.17***	.23***	.41***	.17***
4. Clerical-administration group	0.06	0.23	0.05	0.21	.03	-.36***	-.06	—	-.09*	-.01	-.67***	.10*	.05	-.04	-.01	.06	.06	.17***	.06	-.02
5. Engineering support group	0.11	0.31	0.09	0.28	.18***	-.51***	-.07*	-.07*	—	.12**	.00	.09*	.05	-.02	-.08*	.10*	.08	.11**	.01	.10*
6. Age	38.07	10.40	38.04	10.62	.22***	-.22***	.11**	-.03	.11**	—	.05	.51***	.31***	.02	.04	.11**	.13**	.16***	.05	.15***
7. Gender	0.94	0.23	0.95	0.23	-.03	.29***	.05	-.47***	-.07	.03	—	-.04	-.04	.07	.02	-.06	-.05	-.16***	-.03	-.02
8. Tenure	8.08	6.98	7.77	7.23	.19***	-.21***	.14***	.02	.04	.54***	-.01	—	.50***	.03	-.04	.23***	.14***	.21***	.10**	.24***
9. Employment status (permanent)	0.80	0.40	0.81	0.39	.10**	-.03	.09**	-.04	-.02	.26***	-.01	.49***	—	.01	-.03	.28***	.11**	.17***	.16***	.48***
10. Communication briefs	3.75	1.43	2.89	1.64	.18***	-.21***	.18***	.06	.02	-.06	.00	-.11**	-.15***	—	.17***	.14***	.02	.04	.05	.19***
11. Communication quality	3.43	0.76	3.30	0.84	.23***	-.28***	.18***	.08	.10**	.09*	-.05	.08*	.01	.22***	—	.08*	.23***	.15***	.33***	.00
12. Membership of group	0.75	0.62	0.27	0.52	.26***	-.26***	.20***	-.01	.19***	.15***	.00	.25***	.20***	.10**	.16***	—	.18***	.20***	.27***	.32***
13. Job enlargement	2.87	0.74	2.98	0.96	.27***	-.31***	.22***	-.03	.19***	.15***	-.00	.20***	.15***	.01	.42***	.21***	—	.36***	.37***	.15***
14. Task control	3.85	0.86	3.51	0.89	.36***	-.39***	.22***	.15***	.17***	.17***	-.13***	.22***	.20***	.11**	.31***	.17***	.45***	—	.40***	.16***
15. Decision-making influence	1.86	0.79	1.79	0.79	.43***	-.48***	.40***	.09*	.17***	.14**	-.03	.21***	.21***	.27***	.45***	.25***	.44***	.47***	—	.20***
16. Relevant training	1.10	0.67	1.67	0.04	.21***	-.17***	.18***	.01	.05	.13***	.01	.34***	.50***	.03	.11**	.28***	.20***	.18***	.28***	—

Note. Time 1 correlations are above the diagonal and Time 2 correlations are below the diagonal.
* $p < .05$. ** $p < .01$. *** $p < .001$.

between these practices and RBSE at Time 2 were very similar to those as Time 1.

At Time 1, age had a statistically significant correlation with RBSE ($r = .17, p < .001$), as did tenure ($r = .16, p < .001$) and employment status ($r = .17, p < .001$). Thus, those employees who were older, who had been in the company longer, and who had permanent contracts reported higher levels of RBSE. Gender had no significant zero-order correlation with self-efficacy scores: The mean RBSE for the 39 women in the sample was 2.99 ($SD = 0.99$), and for the 623 men was 3.08 ($SD = 1.00$). Likewise, at Time 2, age, tenure and employment status had significant positive correlations with RBSE, and gender did not have a significant zero-order association.

To test the hypotheses, a hierarchical regression technique was used to partial out the effects of background variable factors. Table 5 shows results of this analysis for the 622 participants who had complete data for all variables at Time 1. In support of the research proposition, an additional 9% of variance in RBSE scores was accounted for by the organizational variables after the entry of background factors ($\Delta R^2 = .09, p < .001$).

Inspection of the beta weights shows that some of the organizational practices were more important than others. Supporting Hypothesis 2, membership of improvement teams had a significant independent contribution to self-efficacy scores ($\beta = .08, p < .01$). Similarly, consistent with Hypothesis 4, the job enrichment variables, task con-

trol and decision-making influence, were both significant predictors of RBSE ($\beta = .11, p < .001$ and $\beta = .24, p < .001$, respectively).

However, despite significant zero-order correlations with RBSE, the remaining organizational variables did not have significant beta weights in the final regression equation. To investigate whether these variables share variance with the background factors, with the work design variables, or both, I carried out additional regression analyses in which each of these variables was entered on their own in Step 2. Using this approach, communication quality was a significant predictor of RBSE ($\beta = .10, p < .01$), as was job enlargement ($\beta = .13, p < .001$), results that suggest these variables share variance with more important predictors (i.e., task control, decision-making influence, and/or membership of improvement groups). In contrast, relevant training and communication briefs were not significant even when entered without the other organizational variables, suggesting that their zero-order correlation with RBSE is probably attributable to their association with background variables.

To test Hypothesis 5, I conducted a hierarchical regression analysis using those 438 employees who were members of improvement groups. Results showed that after entering the background variables, opportunity for involvement made a significant incremental contribution to the regression equation ($\Delta R^2 = .07, p < .001$). As predicted, the greater the opportunity afforded within the group, the higher the RBSE ($\beta = .27, p < .001$).

Although not part of the hypotheses, it is worth noting two additional findings. First, the dummy variable representing the occupational group of shopfloor employees was a significant predictor of RBSE ($\beta = -.22, p < .01$). The direction of beta weight shows that these employees were likely to have lower levels of self-efficacy than others, a finding that is to be expected and is consistent with that reported in Study 1. Second, gender was a significant predictor of RBSE when it was entered as part of the background variables ($\beta = .11, p < .05$). The direction of the beta weight shows that men were likely to have higher self-efficacy scores than women. Because there was no zero-order association between gender and RBSE, this result suggests that one or more of the other background variables acts to suppress the effect of gender. Further analyses showed that it was occupational group that was important in this respect. Specifically, when an analysis of covariance was conducted with the occupational group dummy variables as covariates, there was a significant difference between men and women, $F(1, 660) = 7.60, p < .01$ (there were no significant gender differences when any of the other background variables were used as covariates). Inspection of means by occupational group and gender showed that women had much lower self-efficacy than men in three of the four occupational

Table 5
Summary of Hierarchical Regression Analysis for Variables Predicting RBSE (Study 2, $N = 622$)

Step and predictor	1	2
1. Background factors		
Shopfloor employees	-.32***	-.22**
Managers-supervisors	.15**	.06
Clerical-administration	-.02	-.03
Engineering-support	.04	.06
Age	.05	.05
Gender	.12*	.11*
Tenure	.02	.00
Employment status	.08	.03
2. Organizational variables		
Communication briefs		.03
Communication quality		.00
Membership of group		.08**
Job enlargement		.02
Task control		.11***
Decision-making influence		.24***
Relevant training		.00
R^2	.20***	.29***
Adjusted R^2	.19	.27
ΔR^2		.09***

Note. The displayed coefficients are standardized beta weights at each step. One-tailed tests of the statistical significance of beta weights were used for variables entered in Step 2. RBSE = role breadth self-efficacy. * $p < .05$. ** $p < .01$. *** $p < .001$.

groups. It was only in the engineering group that there were no large differences in RBSE between men and women, but here there were too few women ($N = 4$) for a meaningful analysis. Thus, when occupational group is controlled for, women have lower self-efficacy than men. Women's scores are not lower overall (i.e., no zero-order correlation) because women are underrepresented in the occupational group that has the lowest RBSE (i.e., shop-floor employees).

Longitudinal Analyses and Results

Table 6 shows the longitudinal correlations between variables measured at Time 1 and those measured at Time 2. To test the hypotheses, a hierarchical regression technique was used to predict change in RBSE. The first step was to enter RBSE scores at Time 1, thus controlling for the effect of existing levels of self-efficacy. The next step was the entry of relevant background variables to partial out their effects. In the third step, Time 1 organizational factors were entered to control for the effects of existing levels of these aspects. The fourth step was entry of the Time 2 organizational variables. Any variance accounted for at this final step (estimated by the increase in R^2) is the contribution of change in organizational aspects to change in self-efficacy.

Table 7 shows the results of the regression analysis. At Step 4, where the Time 2 organizational variables were entered, an additional 8% of variance was contributed to the regression equation ($\Delta R^2 = .08, p < .001$), indicating that change in organizational features predicts change in self-efficacy.

More specifically, Time 2 communication quality was a significant predictor of the dependent variable ($\beta = .13, p < .05$), and the direction of the beta weight was as proposed in Hypothesis 1b. Increased communication quality was associated with an increase in self-efficacy, and a decrease in the quality of communication was associated with decreased self-efficacy. Hypothesis 1a, concerning communication briefs, was partially supported. That is, Time 2 communication briefs did not have a significant independent contribution to the regression equation, although an additional regression analysis showed that briefs was a significant predictor when all other Time 2 organizational variables were left out of Step 4 ($\beta = .09, p < .05$).

Hypothesis 4, concerning job enrichment, was also supported. Time 2 task control was the most important predictor of change in self-efficacy ($\beta = .25, p < .001$). The direction of the beta weight suggests that the greater the increase in task control, the more likely an increase in self-efficacy was, and the greater the decrease in task control the more likely a decrease in self-efficacy was (note that with Time 2 task control left out of the equation,

Table 6
Correlations Between Variables Measured at Time 1 and Variables Measured at Time 2 (Based on Longitudinal Sample, $N = 459$)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Role breadth self-efficacy	.79***	-.39***	.32***	.02	.16***	.21***	.03	.19***	.00	.23***	.20***	.24***	.27***	.29***	.46***	.27***
2. Shopfloor employee group	-.31***	.88***	-.37***	-.32***	-.54***	-.16***	.33***	-.21***	.16***	-.22***	-.27***	-.32***	-.27***	-.36***	-.46***	-.22***
3. Management-supervisory group	.25***	-.34***	.64***	.01	-.03	.12*	-.04	.08	.02	.19***	.19***	.32***	.15***	.17***	.34***	.18***
4. Clerical-administration group	-.03	-.36***	-.05	.74***	-.00	.05	-.61***	.14**	.02	.03	.11*	-.00	.01	.18***	.15***	.12*
5. Engineering-support group	.25***	-.55***	.05	-.07	.68***	.11*	-.01	.09	-.27***	.13**	.15***	.15***	.22***	.19***	.26***	.03
6. Age	.21***	-.19***	.08	.03	.08	.99***	.01	-.51***	-.07	-.04	.11*	.14**	.16***	.14**	.09	.11*
7. Gender	.07	.33***	.06	-.48***	-.11*	.01	.98***	.02	.08	.03	.05	-.02	.02	-.12*	-.03	-.05
8. Tenure	.20***	-.21***	.09*	.08	.05	.51***	-.03	.97***	.10*	-.03	.11*	.20***	.20***	.19***	.18***	.21***
9. Employment status (permanent)	.22***	-.23***	.11*	.07	.10*	.35***	.09*	.50***	.19***	-.07	.14**	.14**	.19***	.12*	.20***	.23***
10. Communication briefs	.13**	-.06	.12*	-.01	.02	.01	.08	.04	-.02	.24***	.11*	.06	.03	.07	.14**	.19***
11. Communication quality	.12*	-.09	.16***	-.03	-.04	.04	.00	.01	-.04	.13**	.47***	.06	.23***	.12*	.25*	.07
12. Membership of group	.27***	-.26***	.25***	.02	.17***	.16***	.10*	.25***	.12**	.11*	.14**	.34**	.20***	.16***	.30***	.27***
13. Job enlargement	.21***	-.25***	.21***	.02	.08	.13**	-.04	.16***	.02	.00	.30***	.16***	.53***	.27***	.33***	.10*
14. Task control	.29***	-.38***	.25***	.14**	.14**	.19***	-.15***	.25***	.06	.19***	.26***	.19***	.30***	.58***	.40***	.21***
15. Decision-making influence	.35***	-.29***	.38***	.02	.02	.07	-.06	.14**	-.07	.16***	.34***	.23***	.32***	.29***	.62***	.21***
16. Relevant training	.04	-.14**	.11*	-.01	.05	.03	-.02	.09	-.01	.14**	.39***	.07	.28***	.21***	.26***	.15**

Note. Variables presented in the left-hand column are Time 1 measures, and variables shown across the top are Time 2 measures. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 7
Summary of Hierarchical Regression Analysis for Variables Predicting Change in RBSE (Study 2, N = 459)

Step and predictor	1	2	3	4
1. Time 1 RBSE	-.22***	-.27***	-.29***	-.33***
2. Background variables				
Shopfloor employees		.06	.08	.11
Managers-supervisors		.09	.08	.08
Clerical-administration		.02	.02	-.02
Engineering-support		.18**	.19**	.14*
Age		-.04	-.04	-.04
Gender		.09	.09	.05
Tenure		.04	.03	.02
Employment status		.06	.05	.06
3. Time 1 organizational variables				
Communication briefs			.03	.01
Communication quality			.05	.00
Membership of group			.07	.07
Job enlargement			-.03	-.03
Task control			.03	-.10
Decision-making influence			-.02	-.08
Relevant training			.02	-.00
4. Time 2 organizational variables				
Communication briefs				.03
Communication quality				.13*
Membership of group				.06
Job enlargement				-.03
Task control				.25***
Decision-making influence				.09
Relevant training				.02
R^2	.05***	.08***	.09***	.17***
Adjusted R^2	.05	.06	.07	.12
ΔR^2		.03***	.01	.08***

Note. The displayed coefficients are standardized beta weights at each step. One-tailed tests of the statistical significance of beta weights were used for variables entered in Step 4. RBSE = role-breadth self-efficacy. * $p < .05$. ** $p < .01$. *** $p < .001$.

Time 2 decision-making influence was a significant predictor of change in RBSE, suggesting it did not have a significant beta weight because of its correlation with Time 2 task control).

Time 2 membership of improvement groups was not a significant predictor of change in RBSE, suggesting, at first glance, little support for Hypothesis 2. However, the analysis only allowed a test of the effect of leaving a group, and we do not know what result might have been obtained had it been possible to test the effect of joining one.

Hypothesis 3 was partially supported. Although Time 2 job enlargement did not have a significant beta weight in the final equation of the main regression analysis, when an additional regression analysis was conducted with only this variable in Step 4, this variable was a significant predictor of change in RBSE ($\beta = .09, p < .05$).

There was no support for Hypothesis 4 regarding relevant training. The beta weight in the main regression equation was not significant. Even in a separate regression equation with only Time 2 relevant training included in

Step 4, this variable was not an important predictor of the dependent variable.

It is interesting to observe that the dummy variable representing engineering-support staff was positively associated with change in self-efficacy ($\beta = .14, p < .05$). One possible explanation for this result is the widespread introduction of concurrent product and process development teams within engineering between the first and second survey administration. These teams involve different types of engineers, support staff, and, in some cases production operators, working together to design products, processes, and tools concurrently rather than sequentially. In many respects, the teams represent a particular form of improvement group.

Summary of Study 2

The research proposition that organizational practices will promote RBSE was supported, although the results show that the type of practice is very important. There was clear evidence that some organizational practices promote

RBSE whereas others do not. Data from the longitudinal study showed that increases in communication quality and job enrichment promote greater RBSE. However, there was no evidence from cross-sectional or longitudinal data to suggest that attending relevant training courses has any sustained effect on self-efficacy. Results relating to membership of improvement groups were inconclusive but promising. Although the effect of joining a group could not be tested, there was a clear cross-sectional association between group membership and RBSE and, consistent with hypothesized causal relationship, the greater the opportunity for involvement in the group, the more likely the group member was to have higher self-efficacy. Job enlargement and communication briefs did not make significant independent contributions to the prediction of RBSE change because they shared variance with more important predictors.

Discussion

Summary and Implications

In this article, I investigated the proposition that various organizational interventions can promote the extent to which employees feel confident to take on a wide range of proactive, interpersonal, and integrative tasks—that is, to enhance their RBSE. Using a newly developed scale, shown to be reliable and valid, I conducted two field studies that together provide support for this proposition, albeit demonstrating that only select organizational practices shape the development of RBSE. At a general level, a key implication of this finding is that as well as building a workforce with high self-efficacy by recruiting appropriate employees (such as those with high self-esteem, with a proactive personality style, or with high levels of cognitive ability and intrinsic motivation), the self-efficacy of existing employees can be enhanced through organizational intervention. Given that developing (rather than recruiting) employees can be the most viable option for organizations that are under pressure to downsize and become ever leaner, this is an important conclusion.

More specifically, the studies show that various organizational practices are not equally important. First, there was support for the view that communication promotes RBSE, although evidence suggests it is the quality of communication, rather than simply the presence of briefs, that is key. The more people feel that they are informed, listened to, and encouraged to speak, then the more likely they will develop confidence in carrying out a range of proactive, interpersonal, and integrative tasks. Such two-way communication is not only likely to be a strong source of verbal persuasion, but it also ensures a supportive context in which employees will be more likely to take on additional tasks and actively explore their environment.

High-quality two-way communication might thus act to complement initiatives such as job enrichment.

The second key finding is that work redesign practices are clearly associated with RBSE, although it is the degree of enrichment that is important rather than the extent of enlargement. Cross-sectional data supported the hypothesis that improvement teams—another form of work redesign—will promote RBSE, although further longitudinal investigation is needed to establish the direction of the causality of the relationship. A key implication of this article, therefore, is the potentially critical role of work redesign, and particularly job enrichment, as an intervention to promote RBSE. This type of initiative has rarely, if ever, been investigated as a facilitator of self-efficacy. Gist (1987), for example, described the importance of several organizational interventions in relation to self-efficacy (e.g., training, selection, and leadership), but did not consider the potential role of work redesign.

There are several reasons why job enrichment might be important. In particular, a central feature that distinguishes job enrichment from other organizational practices is the emphasis on increased control over the work environment, including the determinants of performance. As Wood and Bandura (1989) stated, a sense of control is dynamically related to the development of self-efficacy:

When people believe the environment is controllable on matters of import to them, they are motivated to exercise fully their personal efficacy, which enhances their likelihood of success. Experiences of success, in turn, provide behavioral validation of personal efficacy and environmental controllability (p. 374).

Control is also well established as the most important work characteristic for enhancing motivation (Wall & Martin, 1987); thus, job enrichment will increase the extent to which employees want to try out and master new tasks. The element of control also means that job enrichment interventions are rarely a static change. Enriched jobs typically evolve and grow over time as employees' technical and self-managing skills develop, which provides continual exposure to new mastery experiences. This type of initiative thus contrasts with job enlargement, in which employees usually take on a prescribed set of extra tasks, and contrasts with attendance at training courses, which are usually of limited duration and fixed content.

A further reason for the importance of job enrichment is that involvement in higher level decision-making tasks provides a rich source of relevant mastery experiences, and studies suggest that enactive mastery is a more important facilitator of self-efficacy than other kinds of cues (e.g., Bandura, Adams, & Beyer, 1977). For example, if production operators make their own scheduling decisions, they will need to liaise with the planning department, with each other, and with internal customers and

suppliers. Other interventions do not necessarily expand such opportunities. Job enlargement, for example, typically involves increasing the range of technical tasks that employees carry out (e.g., production operators might operate three machines instead of two), which offers much less scope for enactive mastery in relevant tasks.

In sum, by enhancing day-to-day autonomy and participation in decision making, job enrichment can directly increase employees' sense of control over their environment, and can provide sustained and continually expanding opportunities for mastery and modeling experiences. Job enrichment is thus likely to be an especially salient initiative when it comes to promoting RBSE. Turning this conclusion around also highlights some broader implications of the studies, that is, the need to expand work design theory (see also Parker & Wall, 1996; Wall & Jackson, 1995). The results here suggest that RBSE should be considered as an outcome of work redesign in addition to the affective reaction outcomes that are traditionally considered, such as job satisfaction and well-being. Moreover, increased RBSE might be an alternative mechanism by which work redesign can facilitate performance (i.e., work redesign promotes RBSE, which enhances performance), rather than the effort-based mechanism that is typically assumed (i.e., work redesign motivates people to work harder, which enhances performance).

The third key finding of the study concerns the lack of evidence that relevant training promotes RBSE. This result apparently contradicts those from other studies that show a clear link between self-efficacy and training. However, most such studies focus on self-efficacy for a specific task, and it is entirely reasonable to expect that training in the specific task will enhance one's self-efficacy to perform it. For example, Gist (1989) showed that training in innovative problem solving facilitated greater self-efficacy, with self-efficacy being assessed in terms of confidence generating a particular number of ideas within 10 min for improving an aspect of the organization. In contrast to such studies, RBSE is an assessment of self-efficacy across a range of tasks. It is therefore not especially surprising that broader initiatives like job enrichment are stronger predictors of this type of self-efficacy than initiatives that are more restricted in scope and duration, such as training. In addition, although training can enhance people's skills in particular aspects, this type of intervention does not necessarily change the opportunity present in the workplace to use those skills. Over time, when use of the skills is restricted, any increases in self-efficacy associated with training could be lost.

A final significant implication of these studies concerns the relationship between RBSE and background variables, notably gender and age. In the first study, women reported lower RBSE; in the second, when other background vari-

ables were controlled for, women had lower self-efficacy. These findings are consistent with research that suggests women are more likely than men to have low self-confidence in many achievement-oriented tasks (Maccoby & Jacklin, 1974; McCarty, 1986). Nevertheless, as argued by Lenney (1977), this gender difference in self-efficacy depends to a large degree on situational factors, such as the type of ability being assessed, the extent of performance feedback, and social comparison cues. Lenney, for example, found that women MBA students were less confident in those tasks stereotypically associated with men, but were equally confident in those tasks traditionally considered to be more feminine. Similarly, women's self-evaluations were heavily dependent on who they were comparing themselves with, whereas men's self confidence was not affected by such social cues. Thus, the relationships between gender, situation, and self-efficacy are clearly complex, although even based on this brief analysis, it is easy to see how a male-dominated work environment (such as those in the current studies) could constitute a situation that is conducive to women having lower self-efficacy in broad and proactive tasks. If further research replicates these findings, positive action interventions might be warranted to raise women's RBSE, such as ensuring that women receive clear and unambiguous performance feedback (McCarty, 1986) and ensuring that they have equal opportunities for job enrichment.

It is also significant to observe that despite a popular stereotype that older or longer tenure employees will be the least likely to adapt to broader work roles, age and tenure did not have significant negative associations with RBSE or change in RBSE. Indeed, these variables had a positive correlation with self-efficacy in the second study.

Methodological Issues and Suggestions for Further Research

Taken together, the studies presented in this article have many strengths. Personality effects were considered in both studies, in different ways; the results are reasonably consistent across two different organizations; and measures with sound psychometric properties were used. Nevertheless, there are areas that could be improved. One is that the longitudinal analysis only partially tested the hypothesis regarding membership of improvement groups. A study is needed that investigates the effect on self-efficacy of employees opting into improvement groups. A second limitation that has already been alluded to concerns the measure of relevant training. The type of training assessed in Study 2 did not assess the participants' level of technical training, nor did it assess whether they were involved in off-the-job training such as management courses. The current results can only be interpreted as suggesting that training courses such as team working or

improvement techniques are unlikely, on their own, to promote substantially RBSE.

A further issue concerns the use of self-report data for both independent and dependent variables, and therefore the possibility that common method variance is an alternative explanation of the observed relationships. Although it is clearly appropriate to assess self-efficacy using self-report measures (because efficacy is a personal judgement), the organizational variables could be assessed objectively. However, common method variance is unlikely to be the major cause of the association. First, Spector (1987) has argued that properly developed measures are resistant to the method-variance problem. Second, there is considerable research evidence that suggests perceptions of job characteristics are strongly correlated with observer ratings (Fried & Ferris, 1987). Indeed, in the second study, the validity of the measure of task autonomy was shown by another investigation I conducted in which a clearly observed decrease in task autonomy (i.e., brought about by the introduction of a moving assembly line) was consistent with a significant decline in task control scores.

There is an obvious need to conduct this study within other organizations to ascertain the generalizability of the findings, especially given that the study involved two United Kingdom-based firms. There would also be value in continuing to develop the measure of RBSE (e.g., by comparing the Likert approach used here with Bandura's, 1986, approach). At a conceptual level, it is important to investigate the mechanisms by which organizational variables affect RBSE. For example, does job enrichment increase enactive mastery experiences that in turn increase self-efficacy, as I have theorized, and is there is a link between employees' RBSE and their performance? Investigating the latter question will not be straightforward because an appropriate measure of performance is needed. Finally, the relationship between RBSE and employee well-being needs to be examined. Within a complex and uncertain environment, employees with higher RBSE might be better able to cope with the demands that arise, thereby minimizing the stress they experience.

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