Home Alone:
The Role of Technology in Telecommuting

Ellen Baker, University of Technology, Australia

Gayle C. Avery, Maquarie University, Australia

John Crawford, University of Technology, Australia

ABSTRACT

While technology enables home-based telecommuting (HBT), it also has been blamed for its slow growth. Thus, technology both may facilitate and hinder HBT. In order to clarify the role that technology currently plays when employees HBT, this study investigated the relationship between different forms of organizational support (classified as technology-related, somewhat technology-related, and nontechnological) and employees' reactions to HBT. Dependent variables included satisfaction, perceived productivity, and number of days/weeks spent HBT. Respondents were 50 full-time employees from 20 organizations. Two technology-related support variables and manager's trust (a nontechnological support) had a broad impact on employees' reactions to HBT. So, technology plays a crucial role and, thus, could be a major factor in HBT's slow growth, but HBT is better understood within a multi-factor rather than a single-factor framework. Results also indicate that organizations should emphasize providing IT support and appropriate technology for telecommuters as well as HBT-related training for nontelecommuting coworkers and managers.

Keywords: *contradictory impacts; home alone; home computing; organizational innovation; perceived productivity; personal training; satisfaction; telecommuting; telework*

INTRODUCTION

Since the 1980s, there have been predictions that a high proportion of workers will work in their electronic cottage (Braus, 1993; Handy, 1995; Konradt, Schmook, & Mälecke, 2001; Toffler, 1980). Yet the reported proportion of remote workers remains far below the predictions, typically below 10% (European Teleworking Online, 2000; Flexibility Ltd, 2002; Scott & Timmeran, 1999). The reasons for this discrepancy are still unclear, although the figures do vary somewhat, as do the definitions used for gathering the data (Lindorff, 2000). A large body of literature has addressed the question of why the expected shift from working in the office to home-based telecommuting (HBT) has not occurred.

Background

Early research drew attention to resistance to HBT from supervisors, managers, and employer organizations (Olson, 1982; Zuboff,

1982). Attempts to respond to managerial concerns about losing control led to calls for more trust in HBT employees, more use of management by results for HBT (Konradt et al., 2001), and continuing research into effective HBT control strategies (Snell, 1992; Kurland & Cooper, 2002).

The focus then shifted from the managerial side to the prospective HBT employees. Studies established the importance of personal characteristics, such as autonomy or self-efficacy (Belanger, 1999; Katz, 1987; Raghuram, Wiesenfeld, & Garud, 2003), individual coping strategies (Konradt et al., 2001) and job factors (Raghuram, Garud, Wiesenfeld, & Gupta, 2001) in order to increase the likelihood of employees adopting HBT. It also is now recognized that HBT is constrained by the availability of suitable space in the home (Green, Strange, & Trache, 2000) as well as by the characteristics of the person's household (Baruch, 2000).

Increasingly, the literature has reflected a recognition that a broader, multi-factor approach is more appropriate for understanding HBT than the study of single factors because of the complexity of the HBT situation (Bailey & Kurland, 2002; Baruch, 2000; Depickere, 1999; Pearlson & Saunders, 2001; Raghuram et al., 2001). This is also consistent with the recent emphasis on more complex approaches to the study of organizations (Eisenhardt, 2000; Lewis, 2000). Typical of this broader approach to HBT is the summary of research related to the slow growth of telecommuting by Baruch (2000). He concluded that the appropriate variants for each of four factors (telecommuting interface, job, individual, and organization) need to be present simultaneously in order for telecommuting to be effective. The absence of the appropriate variants for any one of these components undermines effective telecommuting, thus slowing the spread of this innovation. Within Baruch's (2000) framework, technology is treated as part of the telecommuting interface and job factors rather than as a separate factor.

The Role of Technology

In contrast to this broader approach, the possibility recently has been raised that it is the technology being used in the home when telecommuting that is the major determinant of the slow growth in the number who work from home. That this is being argued now is somewhat surprising, as the technology available for HBT has improved, and there also has been an increase in the expertise related to information and communications technologies (ICTs) within working populations in developed countries.

The role of technology in HBT, in fact, may be equivocal. On the one hand, the availability of ICTs to connect the HBT employee with others gave rise to expectations of increased HBT. Much of the literature on telecommuting assumes that technology facilitates telecommuting (although the role of technology generally is not addressed empirically), and many definitions of telecommuting specifically mention technology (Baruch, 2000; Belanger, 1999; Nilles, 1998). From this perspective, technology is seen as an enabler and facilitator of HBT. On the other hand, technology may be detrimental to the development of HBT. In *The Social Life of Information*, Brown and Duguid (2000) devote an entire chapter, titled "Home Alone," to the slow growth of HBT. They argue that current technology is still designed so badly that users need to have other employees present in their vicinity so that a group of coworkers can share the load of learning and expertise required to get work done. Brown and Duguid (2000) point to the absence of both technical support and peer support within the home and contrast this with the high level of technical and peer support that is necessary within office environments that have large amounts of IT (Strassmann, 1997). According to this view, it is the technology itself that is slowing the growth of HBT.

Technology could be both facilitating and hindering the development of HBT. Robey and Boudreau (1999) provide evidence that technology sometimes plays contradictory roles in organizational change. One pattern that they identify is when contradictory consequences result from the same technology in a single

organization. An example appropriate to a home setting is when technology is used in a household and gives rise to both centripetal and centrifugal forces, resulting in the technology holding the household together but also tearing it apart (Avery & Baker, 2002).

Technology also can play a contradictory role when different organizational consequences result from the implementation of the same technology in comparable settings. An example is identical communication technologies being appropriated differently by different groups (DeSanctis & Poole, 1994). Robey and Boudreau (2000) suggest that "outcomes diverge because IT is implemented in different social contexts and through different social processes" (p. 56). With respect to technology used for HBT, the social contexts that could be relevant to its implementation are the HBT employee's household and workgroup(s) and the employer organization.

Our aim is to investigate whether technology plays a crucial role in explaining the slow growth of telecommuting. Brown and Duguid (2000) provide no empirical data to support their proposition that technology is the major barrier to the growth of telecommuting. In this study, we compare the impact of technology-related support with other less-technological forms of employer support for HBT employees.

Regarding terminology, working from home using ICT has been studied under many names, and there are no generally accepted definitions of these phenomena (Duxbury, Higgins, & Neufeld, 1998). In the literature, terminology differs from study to study (Hill, Ferris & Martinson, 2003), and the different terms sometimes are used interchangeably (Depickere, 1999; McCloskey & Igbaria, 1998). Within this article, we use the terms *home-based telecommuting* and *working from home* interchangeably.

Organizational Support for HBT

Although telecommuting has been studied extensively and practitioner reports on telecommuting suggest that employer support can be facilitative, there is surprisingly little empirical research on attempts by organizations to facilitate HBT. A pioneering study by Hartman, Stoner, and Arora (1991) is the exception. Their study provides evidence that employer support increases the satisfaction of HBT employees. However, Hartman et al. (1991) did not examine the impact of different forms of support. They studied the technical and emotional support (measured as a single variable) provided by the telecommuting supervisor and found that it was related significantly to telecommuting satisfaction but not to telecommuting productivity. Because technical support and emotional support were not measured separately, it is not clear from their study whether both technical and nontechnical support contributed to HBT satisfaction. Also, only support provided by the telecommuting supervisor was assessed, leaving open the question of the effect of support provided by other sources such as other managers, IT departments, and HR departments.

In our study, we examine the impact of a range of employer support variables selected from three categories that differ in how closely related the support variables are to technology. We limit the scope of the study to variables for which evidence exists from practitioner reports or research studies of a relationship to employees' reactions to HBT.

The first category consists of variables that are related directly to the use of technology. One variable in this category is IT support, which refers to assistance with technology-related problems and questions from the HBT employee. Lack of technical support has been mentioned as a contributor to the stress that some telecommuters report (Deeprose, 1999; Mann, Varey, & Button, 2000; Tan-Solano & Kleiner, 2001). A second variable is appropriateness of the technology used at home, as this also has been mentioned in a number of studies (Fritz, Narasimhan, & Rhee, 1998; Hill, Miller, Weiner, & Colihan, 1998). This variable measures the timely provision of suitable technological resources by the employer.

The second category consists of support variables that are related somewhat to

technology use. Training for HBT employees is an example. Training generally involves instruction in technology use, but for the HBT employee, it also may include topics that are less technology-centered, such as running a home office, occupational health and safety, and even organizational communication (Deeprose, 1999). Training that supports HBT, however, can be provided to people other than the HBT employee rather than to the HBT employee. Some evidence suggests that the training of managers, coworkers, and household members for HBT can be facilitative (Davenport & Pearlson, 1998), although this is not a consistent finding (Felstead, Jewson, Phizacklea, & Walters, 2002). So training of others provides a separate organizational support for HBT employees.

Another variable that is somewhat related to technology use is the provision of financial support for HBT expenses. These expenses are generally for purchasing HBT technology or for its running costs. It has been noted that HBT may just shift costs from the employer to the employee (Baruch, 2000). Costs incurred were mentioned frequently as a problem by employees who HBT (Mann et al., 2000) and were a determinant of employee attitudes toward telecommuting (Iscan & Naktiyok, 2005).

The third category covers support variables that are unrelated to technology (i.e., nontechnological) but have been reported in the literature as being facilitative for HBT employees. A useful framework is provided by Depickere (1999), who argues that organizational structural changes should occur concurrently with the technological changes that support HBT. Examples are using empowerment as a management tool and developing more appropriate approaches to human resource management. One support variable in this category that has been found to be facilitative is employees feeling that they are trusted by their manager when they are working from home and not able to be observed directly by the manager (Davenport & Pearlson, 1998; Konradt et al., 2001). A second is human resource (HR) department support for the HBT employee (Alford, 1999; Deeprose, 1999). This would include anticipating the HR issues that could act as impediments, establishing policies and procedures for dealing with them, and assigning responsibility for HBT issues to a particular person within the HR department. A third variable in this category is prior planning for HBT on the part of the employer (Deeprose, 1999; Piskurich, 1998). In these cases, as part of decision making before commencement of HBT, the employer takes into account the individual needs of the employee and possibly those of other members of his or her household, and the suitability of the employee's home for HBT.

Dependent Variables

We studied the reactions of the participants to HBT from multiple perspectives that were chosen to try to reflect some of HBT's various aspects and, thus, enhance our understanding of the relationship between organizational support and employees' reactions to HBT. The three measures were satisfaction with HBT, perceived productivity with HBT, and number of days per week spent HBT.

For this study, it is the HBT employees' satisfaction with their own work when they work from home that is of interest rather than overall job satisfaction. Satisfaction is used commonly in research on remote and virtual work and has obvious face validity as a measure of employees' reactions to HBT.

Perceived productivity when they work from home is the second measure used in this study. Studies of employees who work from home indicate on the whole that they perceive an increase in their own productivity (Belanger, 1999; Duxbury et al., 1998), although this perceived productivity should not be interpreted as a measure of actual productivity, because those who have volunteered for HBT may be biased in this judgment (Bailey & Kurland, 2002). Productivity is of particular interest for our research, because the Hartman et al. (1991) study mentioned previously found no relationship between technical and emotional support and the telecommuters' perceived productivity.

In addition, a third measure — number of days per week spent HBT — is used in this study on an exploratory basis. This variable has been included in previous studies of HBT as a covariate in order to assist with the understanding of observed relationships (McCloskey & Igbaria, 1998; Ramsover, 1985) or as a moderator (Raghuram et al., 2003), but in this study, we explore its use as a supplementary behavior-based variable to measure reaction to HBT. This is similar to the use of both objective and self-report measures when assessing the outcomes of technology implementations by Venkatesh and Johnson (2002) and the increased use of unobtrusive measures in other social-science research (Page, 2000).

We note that since these three measures were included to reflect different aspects of HBT, the relationships between a given support variable and the three measures might not be of equal strength.

Research Hypotheses

To summarize, in this study we assess the impact of employer support that is classified as technology-related, somewhat technology-related, or nontechnological on employees' reactions to HBT. Based on what the literature indicates as the most likely relationship, we postulated positive relationships between the organizational support variables and employees' reactions to HBT. More specifically, it is hypothesized that the three dependent variables described previously will be related positively to each of the following forms of support:

Technology-Related:

H1a: Amount of IT support for HBT provided by the employer
H1b: Appropriateness of the technology used for HBT

Somewhat Technology-Related:

H2a: Amount of training related to HBT given to the HBT employee
H2b: Amount of training related to HBT given to others (the employee's manager, co-workers, household)

H2c: Extent of employer financial support provided for HBT costs

Nontechnological:

H3a: Amount of prior planning in which the organization engaged for HBT
H3b: Amount of HR support provided for HBT by the employer
H3c: Amount of trust by the HBT employee's manager

DATA COLLECTION

A questionnaire-based approach was taken in order to test the research hypotheses. The questionnaire was designed to obtain HBT employees' perceptions of organizational support provided to them and their reactions to HBT, as well as other relevant information, including demographic characteristics and their use of HBT technology.

Sampling Procedure

In order to ensure that the participants had a reasonable amount of experience with HBT, the first sampling requirement was that respondents must be full-time employees who work from home on a regular basis and have been working from home for at least three months. This intensity sampling entailed selecting "participants who are experiential experts and who are authorities about a particular experience" (Morse, 1994, p. 229).

Eligibility for participation was based on both location of the work and characteristics of the work. Home-based working often is differentiated from work performed in satellite offices, neighborhood work centers, and mobile working (Konradt et al., 2001; Kurland & Bailey, 1999). The European Teleworking Office (ETO) additionally separates supplemental work (taking home extra work after hours), mobile working (from the car or clients' offices), and being self-employed from home-based working (European Teleworking Online, 2000). ETO also uses a relatively stringent criterion in terms of the regularity of home-based working — employees work from home at least one day per week. Because we were interested in

understanding the impact of organizational support on those who HBT regularly, we adopted the more stringent criterion. We adopted the criterion of working from home for at least three months from Igbaria and Tan (1998) and used the official Australian definition for separating part-time from full-time employees (work 20 hours or more per week). The questionnaire defined working from home as follows: "We use the term *working from home* to mean working at your home for your organization. It does NOT mean working at a client's site or at any location other than your home."

We also limited respondents to those in professional roles. There is evidence of differences between professionals and operative workers who work from home, which suggests that the two groups need to be studied separately (Felstead et al., 2002; McCloskey & Igbaria, 2003). Professionals were selected as being more typical of the employees referred to in Brown and Duguid (2000).

The requirements were set out on the front of the questionnaire:

- Work for your employer for 20 or more hours per week,
- Work from home at least one day per week in general,
- Have been working from home for three months or more, and
- Be in a professional role.

If a potential respondent did not meet all these criteria, he or she was asked to pass the questionnaire on to a colleague who did.

A second sampling requirement was that employer organizations should be sufficiently varied so that a range of HBT support variables could be included in the study. In any case, selection of organizations could not be random, because so few people work from home and because it is difficult to locate organizations that have many HBT employees (Lindorff, 2000). So that organizations with contrasting approaches to HBT support would be included, we contacted a wide range of organizations.

These were organizations that had been rated as the Best Employers to Work for in Australia (Hewitt Associates, report released April 2002), organizations selected from *Business Review Weekly*'s 25 largest employers in Australia, major public-sector organizations, and smaller organizations from both the private and public sectors that were not on any of the previous lists.

To satisfy the sampling requirements, a three-step procedure was adopted: organizations were selected, each of their HR departments was asked to identify to the researchers the employees who work from home, and then the researchers mailed questionnaires to those employees. By dealing with respondents directly, we protected their identities from their employers, as ethical guidelines required. Questionnaires were anonymous and were returned directly to the researchers.

In total, the HR departments of 101 organizations in Australia were approached, of which 20 organizations were able to identify HBT employees to us. These organizations were from a variety of industries and sectors and were of varying sizes. Within them, 130 questionnaires were distributed over a six-month period, which provided 50 usable questionnaires.

Measures

All of the measures were obtained from items on the questionnaire. Demographic and HBT information included age, gender, tenure with the organization, who initiated the decision to work from home, how long respondents had been working from home for the organization, and whether they wished to continue to spend about the same amount of time working from home. Regarding technology use when working from home, we asked which technologies respondents use, whether they access their organization's computer system, and, if so, how easy that was to do.

For the satisfaction and perceived productivity measures, we drew upon measures used by Staples, Hulland, and Higgins (1999) for employees working remotely from

their managers. Satisfaction and perceived productivity were measured using five-point scales that were coded so that higher scores represented more satisfaction and productivity. On the HBT satisfaction scale, two items dealt with employees' satisfaction with how they were managed, one with satisfaction with hours of work, and one with variety in the job. A fifth item was added to the Staples et al. (1999) scales that asked directly how satisfied the respondents were with working from home. The perceived productivity scale consisted of four items that dealt with effectiveness, efficiency, productiveness and quality. For the third dependent variable, respondents reported on whether they spent one, two, three, four, or five5 or more days per week working from home, and these options were coded with the corresponding values 1 to 5.

The eight organizational support scales developed specifically for this study as suitable measures were not available from the literature. Items for the following five were presented in a single section: IT-support, appropriateness-of-technology, planning-for-HBT, HR support, and trust-by-manager. Each scale initially consisted of three items, but one of the planning-for-HBT items was removed from the calculation of this scale in order to increase the Cronbach reliability coefficient. Items for these five scales are shown in Appendix A. Responses to the five-point rating scale, ranging from strongly agree to strongly disagree, were coded for each item on a scale of 1 to 5, with a higher score representing a greater amount or quality of that type of support.

Questions about HBT-related training provided by the employer were grouped within the questionnaire. Respondents reported on training for using the technology; other HBT training they had received; and on whether their manager, coworkers, or people in their household had received any training related to their HBT. Two scales were constructed, one for training received by the employee and the second for training received by others. Means were calculated for the responses to the four items listed in Table 1(a) that formed the scale for employee training. (The item managing others in the household was not included, as no respondents reported receiving this type of training.) For each item, a *yes* was coded *1*, and a *no* was coded with a *zero*. For the scale training received by others, responses to the three items shown in Table 1(b) were averaged. These items were coded as follows: extensive = 4; moderate = 3; minimal = 2; and no training = 1.

A separate scale was constructed in order to measure the perceived extent of employer financial support for HBT costs. Items were based on whether the employee, the organization, or both paid for various costs. A scale — organization pays — was formed as the average of responses to the four items listed in Table 1(c). Responses to these items were coded as *I do* = 1; *some me*, *some org* = 2; and *my organization* = 3.

RESULTS

Table 2 gives the demographic characteristics for the sample. Respondents were mainly from private sector organizations (42 out of 50). Females comprised 82% of our sample, which is consistent with other studies reporting that women are more likely to HBT (Belanger, 1999; Iscan & Naktiyok, 2005; Lindorff, 2000). In our sample, 65% were aged in their 30s. An Australian Bureau of Statistics survey (2002) also found that the most common age group for remote workers was 35 to 44 years. Seventy percent had worked for their organization for four or more years. Barnes (1994) reported that those who work from home tend to be long-serving employees, which is consistent with our sample.

The results confirmed that our respondents worked from home on a regular basis and were experienced with this mode of work. Table 2 shows that 68% worked from home more than the eligibility criterion of one day per week. They also had persevered with HBT — 70% had been working from home for their employer for at least one year. Thus, they might be familiar with the technology they are using

Table 1. Training related to HBT and employer financial support for HBT costs

A. Has your organization provided you with training in any of the following areas related to working from home? (please mark all that apply)

Using the technology = 42%
Managing others in household = 0%
Running a home office = 4%
Occupational health and safety = 30%
Organizational communication = 6%

B. To what extent has your organization provided training that is relevant to your working from home to the following people? (mark the most appropriate box in each case)

	Extensive	Moderate	Minimal	No training
Your manager	0%	11%	6%	83%
Your co-workers	0%	8%	11%	82%
People in your home	0%	2.5%	5%	92%

C. Who pays for the various costs incurred in working from home? (please mark the most appropriate box in each case)

	I do	some me, some org	my organization
Who pays running costs?	12%	46%	42%
Who owns (leases or finances) the technology?	6%	40%	54%
Who pays for repairs?	8%	30%	62%
Who paid home modifications? (N/A 18%)	30%	22%	30%

at home and be less dependent on technology support than an employee who has just started to work from home.

Generally, respondents had initiated the decision to work from home themselves (84%) rather than it being mandated by their employer, and most (60%) preferred to continue spending about the same amount of time working from home as they currently did, with another 30% preferring to increase the amount of time a little.

With respect to technology use, almost all the respondents used e-mail and telephone, and about 70% used Internet and laptops when HBT. Respondents clearly were linked by technology to their employers — 98% replied *yes* to a question about needing to access their organization's computer system when HBT, and 92% reported it to be either extremely or quite easy to do. Thus, respondents did use technologies extensively while HBT.

Results for training are given in Tables 1(a) and 1(b). Training provided to HBT employees was mostly for using technology (42%), sometimes for occupational health and safety (30%), and for very little else. It was rare for training to be provided to anyone other than the HBT employee.

Table 1(c) indicates considerable employer financial support for HBT expenses. Except

Table 2. Descriptive statistics for the sample

No. of respondents from various types of organizations
   Best Employers = 14, Largest Private = 5, Other Private Sector = 23, Public Sector = 8, Total = 50

Age
   Less than 30 = 4%, 30-39 = 65%, 40-49 = 18%, 50-59 = 10%, 60+ = 2%

Gender
   male = 18%, female = 82%

Length of time working for this organization
   Less than 1 year = 6%, 1–3 yrs = 24%, 4–10 yrs = 40%, more than 10 yrs = 30%

On average, number of days per week work from home
   1 = 32%, 2 = 26%, 3 = 10%, 4 = 14%, 5 or more = 18%

Who initiated the decision for you to work from home?
   I initiated it = 84%, Someone else in org = 14%, Other =2%

Would you prefer to increase or decrease the amount of time you spend working from home?
   Decrease it a lot = 0%, Decrease it a little = 8%, Continue about the same = 60%, Increase it a little = 30%, Increase it a lot = 2%

How long have you been working from home for this organization?
   Less than 1 year = 30%, 1–5 years = 62%, more than 5 years = 8%

Do you ever need to access your organization's computer system when working from home?
   Y = 98%, N = 2%
   Of those that do, *how easy is it for you to access the organization's computer system?*
   Extremely easy = 46%, Quite easy = 46%, Quite difficult = 8%

Which technologies/services do you use for work purposes when working from home? (mark all that apply)
   Desktop computer = 38%, Internet = 74%, Pager = 4%, Mobile phone = 60%, Laptop = 70%, E-mail = 96%, Telephone = 92%, Facsimile = 48%

---

for costs relating to home modifications, fewer than 12% of respondents paid for their own HBT costs. Even for home modifications, only about one-third of the sample reported bearing the entire cost themselves, and the employer paid in an equal proportion of cases.

   Table 3 shows the descriptive statistics for all the scales. With respect to reliability, nine of the 10 scales yielded Cronbach alpha coefficients that are adequate. Cronbach alphas for the Satisfaction and Perceived Productivity scales (.73 and .87, respectively) were acceptably high. Four of the organizational support scales had alpha values above the generally accepted value of about .70, and three were marginally below this value. One of the scales, appropriateness-of-technology, had an alpha coefficient of only .46. However, inspection

Table 3. Cronbach alphas, means and standard deviations for variable scales

Scales	Cronbach alpha	Mean	S.D.
Satisfaction	.73	4.07	0.68
Perceived-Productivity	.87	4.60	0.49
IT-Support	.74	4.34	0.64
Appropriateness-of-Technology	.46	4.17	0.67
Training–Employee	.62	0.20	0.26
Training–Others	.86	1.23	0.55
Organization-Pays	.79	2.36	0.56
Planning-for-HBT	.75	3.17	1.57
HR-Support	.63	3.68	0.93
Trust-by-Manager	.64	4.40	0.67

of the items comprising this scale suggests that this might be more appropriately regarded as a formative rather than a reflexive scale with the three items representing different facets or aspects of the construct rather than being indicators reflecting a single construct (see Edwards and Bagozzi [2000] for a discussion of the distinction between these two types of scales). As a formative scale, its adequacy does not rely on positive associations among its component items or on a high value of the Cronbach alpha coefficient. Thus, despite the low measured value of its Cronbach alpha coefficient, the appropriateness-of-technology scale was included in the analysis.

With respect to the first category — technology-related support variables — our respondents evaluated the IT support they received and the technology they were using positively. On a 1 to 5 scale, where 5 was strongly agree, the mean for the IT-Support scale was 4.34, and the Appropriateness-of-Technology scale was 4.17.

Construction of the scales and results obtained on the training and financial support variables, which are from the second category

that was somewhat technology-related support variables, already have been reported. No items needed to be removed from these scales on the basis of examining the scale's reliability. Note that means are reported for these scales in Table 3 for completeness but are not based on a five-point rating scale and, therefore, should not be compared to the means reported for the other support scales.

For the third category — nontechnological support — all of the variables were measured on a 1-5 scale, where 5 was strongly agree. The three variables yielded quite different means — Planning-for-HBT (3.17), HR-Support (3.68), and Trust-by-Manager (4.40). Thus, Trust-by-Manager was evaluated more positively than the other two variables.

The results for satisfaction and perceived productivity indicate that the respondents had positive reactions to HBT. Mean satisfaction was 4.07 on a scale of 1-5, where 5 was very satisfied. On a 1-5 scale, where 5 is strongly agree and represents high perceived productivity, the mean rating was 4.60. Respondents' positive evaluations of HBT on these measures is consistent with their perseverance with HBT

Table 4. Correlations between organizational support and reactions to HBT

Reactions to HBT	Satisfaction	P-Productivity ^	No. days/wk HBT
Organizational Support			
Technology-related variables			
IT-Support	.356**	.031	.347**
Appropriateness-of-Technology	.300*	.178	.392**
Somewhat related to technology			
Training–Employee	.187	.107	.098
Training–Others	.421**	.052	.072
Organization-Pays	.128	.291*	.231
Non-technological variables			
Planning-for-HBT	.196	.092	.102
HR-Support	.304*	.213	.043
Trust-by-Manager	.374**	.192	.334**

* p < .05, 1-tailed   ** p < .01, 1-tailed   ^ Perceived Productivity

and their preference for spending at least the same amount of time working from home in the future, as reported previously.

Correlations and Hypotheses Testing

Table 4 shows the correlations between the organizational support variables and the dependent variables. (Note that for tests of statistical significance, one-tail tests were used because of the directional nature of the hypotheses.) Partial correlations between these variables also were calculated, controlling for age, gender, tenure with the organization, and how long respondents had been working from home for the organization. For correlations with satisfaction and perceived productivity, number of days/week spent HBT was also included as one of the control variables, as was done in previous, similar HBT studies (Igbaria, 1998; McCloskey & Igbaria, 2003; Ramsower, 1985). Comparison of the partial and zero-order correlations showed only minor differences in magnitude, generally in the order of .05. All statistically significant zero-order correlations remained statistically significant. To save space, therefore, only the zero-order correlations are reported in this article.

Three of the support variables were related significantly to both Satisfaction and Number of days/week spent HBT, which suggests that they have broader impact on employees' reactions to HBT than the other support variables. They were IT-Support and Appropriateness-of-Technology, which were the two technology-related variables, and Trust-by-Manager, one of the nontechnological support variables.

So, technology-related support does appear to be crucial for HBT, as proposed by Brown and Duguid (2000). However, at least one nontechnological support variable provided to the employee — manager's trust — also has comparable impact. The overall results indicate that technology has a major impact on employees' reactions to HBT, but support that is more closely related to technology does not have more impact than support that is less closely related to technology. Thus, other factors also appear to be important.

Table 5. Correlations among the three dependent variables

Scales	Satisfaction	Perceived-Productivity	No. days/wk HBT
Satisfaction		.326*	.244*
Productivity			.171
No. days/wk HBT			

* p < .05, 1-tailed   ** p < .01, 1-tailed

Table 4 also shows that three of the employer support variables were related to only one dependent variable, but it was not the same dependent variable in each case. HR-Support and Training-Others were related only to Satisfaction; Organization-Pays was related only to Perceived-Productivity.

Table 5, which shows the correlations among the three dependent variables, provides a possible explanation for these divergent relationships. There was a statistically significant correlation between Satisfaction and Perceived-Productivity and between Satisfaction and Number of days/week spent HBT, but not between Perceived-Productivity and Number of days/week spent HBT. The correlations were not high, however, suggesting that the three measures do represent different aspects of HBT.

Perceived-Productivity also differs from the other two dependent variables in how it relates to the support variables. Perceived-Productivity related only to Organization-Pays, and not to the other support variables. Thus, when the organization pays more of the HBT costs, the employee rates their HBT productivity more highly.

Satisfaction and Number of days/week spent HBT were more similar to each other in their relationships to the support variables: IT-Support, Appropriateness-of-Technology, and Trust-by-Manager were related significantly to both.

The combined effect of the organizational support variables on each of the three dependent variables was evaluated by calculation of multiple correlation coefficients. Multiple correlations of the eight support variables with Satisfaction, Perceived-Productivity and Number of days/week spent HBT were .58, .41, and .51, respectively. Thus, Satisfaction and Number of days/week spent HBT were more strongly predicted by the combined effects (34.0% and 25.9% of variance explained, respectively) than was Perceived-Productivity, for which only 16.9% of the variance was explained. This suggests that organizations may be more able to influence Satisfaction and Number of days spent HBT than Perceived-Productivity through the support given to HBT employees.

Planning-for-HBT and Training-Employee were not related to any of the dependent variables. Training in using technology, a component of the Training-Employee scale, also was not related to any of the dependent variables.

Table 6 shows the correlations among the various organizational support scales. It indicates that these scales all are related positively, with most of the correlations statistically significant at the .05 level. The highest correlation was between the two technology support scales —Appropriateness-of-Technology and IT-Support — and each of these was related to five of the other support scales. Thus, in this sample, an HBT employee who received technology-

Table 6. Correlations among organizational support scales

Scales	1	2	3	4	5	6	7	8
1. IT-Support								
2 Appropriateness-of-Technology	.604**							
3. Training–Employee	.189	.284*						
4. Training–Others	.257*	.139	.396**					
5. Organization-Pays	.253*	.375**	.225	.098				
6. Planning-for-HBT	.286*	.465**	.508**	.149	.162			
7. HR-Support	.405**	.522**	.497**	.358*	.188	.534**		
8. Trust-by-Manager	.519**	.342**	.133	.208	.147	.121	.236	

* p < .05, 1-tailed   ** p < .01, 1-tailed

related support also was likely to receive other forms of organizational support for HBT.

DISCUSSION

We examined the relationship between employees' reactions to HBT and organizational support variables that differed in how closely they related to technology use in a sample of experienced HBT employees. The results indicated that some types of organizational support have a broader impact than others. Having sufficient IT support and appropriate HBT technology and being trusted by one's manager all were related to both satisfaction and to spending more days/week working from home. Two of these support variables are technology-related and one is nontechnological.

With respect to our research question — whether technology plays a crucial role in explaining the slow growth of telecommuting — our study, therefore, leads to the conclusion that even for experienced HBT employees, the technology-related support they receive influences their reactions to HBT. Thus, technology does still play a crucial role in HBT. This conclusion is consistent with the position of Brown and Duguid (2000), that it is the HBT technology that is slowing the growth of HBT.

However, the results for the three categories of support variables studied (technology-related, somewhat technology-related, nontechnological) do not indicate that support that is more closely related to technology has more impact on reactions to HBT than support that is less closely related to technology. Therefore, our overall results are more consistent with the predominant view in the telecommuting literature, which is that a broader, multi-factor approach is more appropriate for understanding HBT than the study of single factors.

It was surprising that Brown and Duguid (2000) took a single-factor approach to explaining HBT after there had been nearly two decades of wide-ranging research into HBT, and it was also surprising that technology-related support emerged as an important factor in our study, which was limited to experienced HBT employees. The impact of technology had been ignored in recent years as researchers focused

on other categories of factors. These other categories can be grouped into those relevant to the individual, their household, their manager, their work-groups, and their organization. The factors from each of these categories likely are to be influenced by factors from another category; for example, an organizational culture in which managers are expected to share information, and delegate decision making is likely to influence the manager's attitude toward HBT and also the design of jobs within that organization. There are also likely to be flow-on effects within the workgroups when an employee begins to work from home; for example, increased structure may be required to replace chance encounters and informal discussions (Pearlson & Saunders, 2001), although the extent of effects is likely to depend on how many days per week employees HBT and the proportion of employees who HBT (Bailey & Kurland, 2002). In addition, there may be multiple, contradictory impacts of HBT, as examined in the next section.

Contradictory Impacts of HBT Technology

A more encompassing view of HBT technology, which is in line with the suggestions of Poole and Van de Ven (1989) and Lewis (2000) that opposition should be incorporated in explanations, is that technology both facilitates and hinders the growth of HBT. Technology has been shown to play contradictory roles, when differing consequences result from the implementation of the same technology in a single organization (Robey & Boudreau, 1999) and when it is implemented in different social contexts (Robey & Boudreau, 2000). We now provide two illustrative examples of how technology could have contradictory impacts on HBT outcomes.

The question of how HBT employees are able to work at home alone without the technical and peer support that Brown and Duguid (2000) argue is necessary provides the first example. Recall that our respondents were largely long-serving employees who could be assumed to have absorbed both technology expertise and their organization's culture. It has been reported that some organizations required a minimum number of years of working with the company before an employee was allowed to HBT (Barnes, 1994; Kraut, 1989). Thus, organizational tenure may provide experience in solving technological problems that substitute to some extent for technical and peer support. This substitution effect, the overcoming of the usual negative consequences of a discontinuity by factors from a different level within a complex situation, has been identified by Watson-Manheim, Chudoba, and Crowstow (2002) in other virtual work environments.

The second example builds on a recent study of IBM employees, who, in contrast to most HBT employees that have been studied, considered their home as their primary work site (Hill et al., 2003). These IBM employees held an optimistic view of their opportunities for career advancement, which is also contrary to most other studies (McCloskey & Igbaria, 2003). Hill et al. (2003) suggest that HBT has been used so extensively and for so long in IBM that these arrangements have become normalized. Apparently, IBM provides a different social context for HBT than most other organizations do.

In summary, we have suggested that technology be viewed as both facilitating and hindering the development of HBT, and we have provided examples of contradictory impacts on HBT outcomes. This approach is consistent with calls to consider the broader context for IT generally (Robey & Boudreau, 1999) as well as for HBT specifically (Baruch, 2000; Raghuram et al., 2001).

Managerial and Research Implications

Our study contributes to the understanding of how employer organizations can assist their HBT employees. The results indicate that technology-related as well as nontechnological support can influence reactions to HBT, extending earlier findings in a number of ways. Hartman et al. (1991) found that technical and emotional support was related to telecommuting satisfaction but not to perceived productivity. We measured their single variable — technical

and emotional support — as three separate variables (IT-support, Appropriateness-of-Technology, and Trust-by-Manager) and confirmed the Hartman et al. (1991) findings that each of these three variables was related significantly to satisfaction but not to perceived productivity.

The results also increase our understanding of influences on employee assessments of HBT. Perceived productivity was related only to one of the support variables: the organization paying some HBT costs. This form of support may signal serious organizational support to HBT employees. Our analysis of the combined effects of the support variables on each of the three dependent variables indicated that organizations are more able to influence satisfaction and number of days spent HBT than perceived productivity. In any case, the three measures do seem to reflect distinct aspects of HBT, which should be taken into account when managing HBT employees and in future research on HBT.

Number of days per week spent HBT was introduced in this study on an exploratory basis as a possible behavior-based measure of employee reactions to HBT in order to supplement the two ratings-based measures. It was found to have a low (.244) but significant correlation with satisfaction and to be somewhat similar to satisfaction in terms of its relationships with support variables. Therefore, it would appear to be a useful supplementary measure of reactions to HBT in situations in which the employees have some discretion over HBT decisions. The degree of discretion should be assessed directly in future telecommuting research involving professionals, who apparently do have more choice of work location than operative workers who HBT (Felstead et al., 2002; McCloskey & Igbaria, 2003).

Our study also indicates that organizations that want to support positive HBT relationships may need to change their focus. Currently, HBT employees appear to be provided with technology and training in the use of the technology. Our results indicate that both ongoing IT support and emphasis on the appropriateness of the technology are particularly important

to HBT employees. In addition, there seems to be symbolic value attached to the financial support provided to cover the extra expenses incurred when working from home. Positive relationships also were found for the feeling that managers trust HBT employees when the latter is working from home, and for support from the HR department.

Our results for training may surprise IT and training departments. Employee training in its current forms was not related to any of the dependent variables, and training in using technology, which was measured as a separate component, also was not related to any of the dependent variables. Less than half of the sample received HBT-related training, and the training that was provided had a narrow focus on using technology or occupational health and safety rather than on the broader issues such as how to communicate more effectively with the office or how to manage other members of the household. Our findings on training suggest that employers should explore a broader approach to HBT training, and research should be carried out on the relation of this training to HBT reactions.

Our results also point toward extending training to the nontelecommuting employees and managers that work with the telecommuters. We found that it was rare for training to be provided to anyone other than the telecommuting employee, although practitioner reports suggest that companies that have successful HBT programs train both the potential HBT employees and their managers to deal with the changes HBT brings to working conditions and relationships (Deeprose, 1999). Kurland and Cooper (2002) also found that telecommuting training was sparse, even though HR personnel held a contrary belief, and these researchers recommended more adequate training of the HBT employees, their managers, and their co-workers. For our sample, training of others was related to HBT satisfaction and, in fact, had the highest correlation with satisfaction of any of the support variables. Although these correlations were based on small numbers because few nontelecommuters received training, it appears

that when training of others does occur, it has a considerable effect, thus reinforcing the advice from the practitioner literature.

We suggest to researchers that it would be better to approach the IT departments rather than the HR departments to locate HBT employees. When information about HBT is centralized within an organization, it is more likely to be in the department supplying the technology infrastructure. It is also the IT department that needs to be made aware of the importance of broader approaches to training and of the need to provide nontechnological as well as technology-related support for HBT employees. It is encouraging that employers providing technology-related support in our study were likely to provide some nontechnological support, as well.

We also suggest that the issue of gender differences should be examined within a broader framework. There were no statistically significant gender differences for the variables we studied, but this may not be a reliable result, given the preponderance of females (82%) in the sample. Examining telecommuters' motivations and concerns, Mokhtarian, Bagley, and Salomon (1998) found that women rated the advantages of telecommuting more highly, were more likely to have family, personal benefits, and stress reduction as motivations for telecommuting and to have concerns about lack of visibility to management. In general, HBT employees are concerned about the impact on their careers (McCloskey & Igbaria, 2003). Organizations that wish to support their HBT employees should try to do so in a way that addresses these potential disadvantages. Recent literature suggests that doing so will benefit both male and female employees and the employer. Hill et al. (2003) found that the IBM employees they studied held an optimistic view of their opportunities for career advancement and suggested that this was because HBT arrangements have become normalized within IBM. Stavrou (2005) reported that there has been a shift during the past decade among employees toward desiring a better balance for their work and nonwork responsibilities and that providing home-based

work and teleworking options was related to improved organizational performance and reduced absenteeism.

Finally, as advances are made in the technology used by telecommuters, the importance of technology-related support relative to other organizational supports may change. Communication between HBT employees and others is likely to be improved by changes to transmission media and the technology used in the home. However, it is not clear whether this will increase or decrease the role of technology in HBT, so it will need to be studied at the time.

Limitations

The main limitation was the small number of respondents due to the difficulty of locating full-time employees who HBT on a regular basis. Although this difficulty is likely to remain, future researchers are advised to seek respondents via an organization's IT department rather than through HR. Also, our results are limited to those who are in a professional role and may be different for nonprofessionals.

In addition, our study was based on employee perceptions rather than on direct evidence. Further studies could utilize direct measures of the existence and quality of training programs, financial support, and other support variables as well as level of productivity. Also, this study could only capture the reactions of the HBT employees at one point in time. In order to better understand the adaptations that telecommuters, their households, and their coworkers go through, research should be conducted longitudinally.

A further limitation is that although we included variables relating to HBT that commonly are reported in the academic literature and practitioner reports, additional variables could be studied in the future. The four factors identified by Baruch (2000)—the telecommuting interface, job, individual, and organization—provide a useful framework for exploring them. Thus, telecommuting interface variables could include the characteristics of the household, number and ages of any children, and

whether there is sufficient space for HBT. Job variables might include the interdependence of the work, provision of feedback, and the career paths available. Individual variables could be personal characteristics, work motivations, and preferred work style. Organization variables might cover the culture, management style, and policies related to HBT.

CONCLUSION

While technology generally is acknowledged as an enabler of telecommuting, it also has been blamed recently for the slow growth of home-based telecommuting (Brown & Duguid, 2000). In this study, we investigated the role that technology currently plays when employees work from home on a regular basis. We compared the impact of employer support variables that differed in how closely they related to technology use and on employees' reactions to HBT. Two technology-related support variables — IT support and appropriate technology—and being trusted by the manager were related significantly to both satisfaction and number of days per week spent HBT. Thus, even for experienced HBT employees, technology-related support has a broad impact on their reactions to HBT. This indicates that technology still does play a crucial role in home-based telecommuting, which is consistent with the argument of Brown and Duguid (2000). However, in contrast to their single-factor approach, the overall pattern of results indicates that HBT is understood better within a multi-factor framework that acknowledges that HBT takes place within a complex social and organizational context. We suggested adopting a more encompassing view that technology both facilitates and hinders the development of HBT. This approach encourages studies that help us to understand better the contradictory role of technology and, thus, may lead to improved employer support for HBT employees.

ACKNOWLEDGMENTS

REFERENCES

Alford, R.J. (1999). Going virtual, getting real. *Training and Development*, *53*(1), 34.

Australian Bureau of Statistics. (2002, October). Teleworking New South Wales. *Australian Bureau of Statistics Report, 1373.1*.

Avery, G.C., & Baker, E. (2002). Reframing the infomated household-workplace. *Information and Organization*, *12*, 109–134.

Bailey, D.E., & Kurland, N.B. (2002). A review of telework research: Findings, new directions, and lessons for the study of modern work. *Journal of Organizational Behavior*, *23*, 383–400.

Barnes, K. (1994). Tips for managing telecommuters. *HR Focus*, *71*(11), 9–10.

Baruch, Y. (2000). Teleworking: Benefits and pitfalls as perceived by professionals and managers. *New Technology, Work and Employment*, *15*(1), 34–49.

Belanger, F. (1999). Workers' propensity to telecommute: An empirical study. *Information and Management*, *35*(3), 139–153.

Braus, P. (1993). Homework for grown ups. *American Demographics, 15*(8), 38–42.

Brown, J.S., & Duguid, P. (2000). *The social life of information*. Boston: Harvard Business School Press.

Davenport, T.H., & Pearlson, K. (1998). Two cheers for the virtual office. *Sloan Management Review, 39*(4), 51–65.

Deeprose, D. (1999, October). When implementing telecommuting leave nothing to chance. *HR Focus, 13*.

Depickere, A. (1999). Managing virtual working: Between commitment and control. In P. Jackson (Ed.), *Virtual working: Social and organizational dynamics* (pp. 99–120). London: Routledge.

DeSanctis, G., & Poole, M.S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, *5*(2), 121–147.

Duxbury, L., Higgins, C., & Neufeld, D. (1998). Telework and the balance between work and family: Is telework part of the problem or part of the solution? In M. Igbaria, & M. Tan. (Eds.), *The virtual workplace* (pp. 218–255). Hershey, PA: Idea Group Publishing.

Edwards, J.R., & Bagozzi, R.P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, *5*(2), 155–174.

Eisenhardt, K. (2000). Paradox, spirals, ambivalence: The new language of change and pluralism. *Academy of Management Review*, *25*(4), 703–705.

European Teleworking Online. (2000). *How many teleworkers?* Retrieved May 24, 2000, from http://www.eto.org.uk

Felstead, A., Jewson, N., Phizacklea, A., & Walters, S. (2002). Opportunities to work at home in the context of work-life balances. *Human Resource Management Journal, 12*(1), 54–76.

Flexibility Ltd. (2002). *Telework in the UK: Who's doing it?* Retrieved April 8, 2004, from http://www.flexibility.co.uk/flexwork/location/telework-2002.htm

Fritz, M.B.W., Narasimhan, S., & Rhee, H-S. (1998). Communication and coordination in the virtual office. *Journal of Management Information Systems, 14*(4), 7–28.

Green, H., Strange, A., & Trache, H. (2000). The homeworking revolution: Considering the property dimension. *Regional Studies, 34*(3), 303–307.

Handy, C. (1995). Trust and the virtual organization. *Harvard Business Review, 73*(3), 40.

Hartman, R.I., Stoner, C.R., & Arora, R. (1991). An investigation of selected variables affecting telecommuting productivity and satisfaction. *Journal of Business and Psychology, 6*(2), 207–225.

Hewitt Associates. (2002). *Best employers to work for in Australia study 2000 — Summary of findings*. Sydney: Hewitt & Associates.

Hill, E.J., Ferris, M., & Martinson, V. (2003). Does it matter where you work? A comparison of how three work venues (traditional office, virtual office, and home office) influence aspects of work and personal/family life. *Journal of Vocational Behavior*, *63*(2), 220-241.

Hill, E.J., Miller, B.C., Weiner, S.P., & Colihan, J. (1998). Influences of the virtual office on aspects of work and work/life balance. *Personnel Psychology, 51*(3), 667–683.

Igbaria, M., & Tan, M. (Eds.). (1998). *The virtual workplace*. Hershey, PA: Idea Group Publishers.

Iscan, O.F., & Naktiyok, A. (2005). Attitudes towards telecommuting: The Turkish case. *Journal of Information Technology*, *20*, 52–63.

Katz, A. (1987). The management, control, and evaluation of a telecommuting project: A case study. *Information and Management*, *13*, 179–190.

Konradt, U., Schmook, R., & Mälecke, M. (2001). Impacts of telework on individuals, organizations and families — A critical review. In C.L. Cooper, & I.T. Robertson (Eds.), *Organizational psychology and development: A reader for students and practitioner* (pp. 339–375). Chichester: Wiley.

Kraut, R.E. (1989). Telecommuting: The tradeoffs of homework. *Journal of Communication*, *39*, 19–47.

Kurland, N.B., & Bailey, D.E. (1999). Telework: The advantages and challenges of working here, there, anywhere, and anytime. *Organizational Dynamics, 28*(2), 53–68.

Kurland, N.B., & Cooper, C.D. (2002). Manager control and employee isolation in telecommuting environments. *The Journal of High Technology Management Research, 13*(1), 107–126.

Lewis, M.W. (2000). Exploring paradox:

Toward a more comprehensive guide. *Academy of Management Review*, *25*(4), 760–776.

Lindorff, M. (2000). Home-based telework and telecommuting in Australia: More myth than modern work form. *Asia Pacific Journal of Human Resources*, *38*(3), 1–11.

Mann, S., Varey, R., & Button, W. (2000). An exploration of the emotional impact of tele-working via computer-mediated communication. *Journal of Managerial Psychology, 15*(7), 668.

McCloskey, D.W., & Igbaria, M. (1998). A review of the empirical research on telecommuting and directions for future research. In M. Igbaria, & M. Tan (Eds.), *The virtual workplace*. Hershey, PA: Idea Group Publishing.

McCloskey, D.W., & Igbaria, M. (2003). Does "out of sight" mean "out of mind"? An empirical investigation of the career advancement prospects of telecommuters. *Information Resources Management Journal*, *16*(2), 19–34.

Mokhtarian, P.L., Bagley, M.N., & Salomon, I. (1998). The impact of gender, occupation and presence of children on telecommuting motivations and constraints. *Journal of the American Society for Information Science*, *49*(12), 1115–1134.

Morse, J.M. (1994). Designing funded qualitative research. In N.K. Denzin, & Y.S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 220–235). Thousand Oaks, CA: Sage.

Nilles, J.M. (1998). *Managing telework: Strategies for managing the virtual workforce*. New York: Wiley.

Olson, M.H. (1982). New information technology and organizational culture. *Management Information Systems Quarterly*, *6*, 71–92.

Page, S. (2000). Community research: The lost art of unobtrusive methods. *Journal of Applied Social Psychology*, *30*, 2126–2136.

Pearlson, K.E., & Saunders, C.S. (2001). There's no place like home: Managing telecommuting paradoxes. *The Academy of Management Executive*, *15*(2) 117–128.

Piskurich, G.M. (1998). *An organizational guide to telecommuting: Setting up and running a successful telecommuter*. Alexandria, VA: American Society for Training and Development.

Poole, M.S., & Van de Ven, A.H. (1989). Using paradox to build management and organization theories. *Academy of Management Review*, *14*, 562–578.

Raghuram, S., Garud, R., Wiesenfeld, B., & Gupta, V. (2001). Factors contributing to virtual work adjustment. *Journal of Management*, *27*, 383–405.

Raghuram, S., Wiesenfeld, B., & Garud, R. (2003). Technology enabled work: The role of self-efficacy in determining telecommuter adjustment and structuring behaviour. *Journal of Vocational Behavior*, *63*(2), 180–198.

Ramsower, R.M. (1985). *Telecommuting: The organizational and behavioral effects of working at home*. MI: UMI Research Press.

Robey, D., & Boudreau, M.-C. (1999). Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications. *Information Systems Research*, *10*, 167–185.

Robey, D., & Boudreau, M.-C. (2000). Organizational consequences of information technology: Dealing with diversity in empirical research. In R.W. Zmud (Ed.), *Framing the domains of IT management: Projecting the future… through the past.* (pp. 51–63). Cincinnati, OH: Pinnaflex.

Scott, C.R., & Timmeran, C.E. (1999). Communication technology use and multiple workplace identifications among organizational teleworkers with varied degrees of virtuality. *IEEE Transactions on Professional Communication*, *42*(4), 240–260.

Snell, S.A. (1992). Control theory in strategic human resource management: The mediating effect of administrative information. *Academy of Management Journal*, *35*(2), 292–327.

Staples, D.D., Hulland, J.S., & Higgins, C.A. (1999). A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Organization Science*, *10*(6), 758–776.

Stavrou, E.T. (2005). Flexible work bundles and organizational competitiveness: A cross-national study of the European work context. *Journal of Organizational Behavior, 26*(8), 923–947.

Strassmann, P.A. (1997). *The squandered computer: Evaluating the business alignment of information technologies*. New Canaan, CT: Information Economics Press.

Tan-Solano, M., & Kleiner, B.H. (2001). Effects of telecommuting on organizational behaviour. *Management Research News*, *24*(3/4), 123–126.

Toffler, A. (1980). *The third wave*. New York: Morrow.

Venkatesh, V., & Johnson, P. (2002). Telecommuting technology implementations: A within- and between-subjects longitudinal field study. *Personnel Psychology, 55*, 661–687.

Watson-Manheim, M.B., Chudoba, K.M., & Crowstow, K. (2002). Discontinuities and continuities: A new way to understand virtual work. *Information, Technology and People*, *15*(3), 191–209.

Zuboff, S. (1982, September-October). New worlds of computer-mediated work. *Harvard Business Review*, 142–152.

APPENDIX A

Items for the following five organizational support scales were presented to respondents in a single section in mixed order. For the formation of summative scales, items indicated by (Rev) were reverse coded.

IT-Support
I receive as much technological support as I need when working from home.
The quality of the technological support I receive when working from home is not high. (Rev)
When I have a technology-related query from home, someone in the organization is always accessible.

Appropriateness-of-Technology
My organization provides me with appropriate technological resources to do my work at home successfully.
My organization responds promptly to my requests for technological resources (e.g., fax, mobile phone).
The technology I use when working from home is not easy to cope with. (Rev)

Planning-for-HBT
My organization did not assess my home for its suitability for working from home. (Rev)
My organization ordered me to start working from home. (Rev) [removed]
My organization assessed my work and personal needs prior to my starting working from home.

HR-Support
No specific person in my organization is responsible for the people side of working from home. (Rev)
The quality of the support for the people side of working from home that I receive is not high. (Rev)
I receive as much support as I need to resolve issues related to working from home when they arise.

Trust-by-Manager
My manager doesn't think I slack off or goof off when I'm working from home.
My manager worries that I am not getting the job done when I work from home. (Rev)
My manager is trusting me more and more as I continue to work from home.

Ellen Baker is an honorary associate in the School of Management at the University of Technology, Sydney in Australia. She holds a BA in mathematics from NYU and a PhD in psychology from the University of London. Her research has appeared in Information and Organization*,* Journal of Organizational Change Management*, and* Computer Supported Co-operative Work*. She has contributed chapters to Idea Group and IRM books, and has presented regularly at Academy of Management and Decision Sciences conferences. Her current research interests include remote collaboration, home-based virtual work, technology innovation and diffusion, and new organizational forms.*

Gayle C. Avery is professor of management at Macquarie Graduate School of Management, Macquarie University, Sydney, Australia. She holds a BA (1st class honors) and an MTCP from the University of Sydney, and a PhD in psychology from Monash University. Her area of specialization is leadership, including leadership of virtual organizations. Author of Understanding Leadership and Leadership for Sustainable Futures*, her research has appeared in the* Journal of Management Development*,* Information & Organization*,* Journal of Quality Management*, and* Leadership & Organization Development Journal*, among others. She advises senior executives in a wide range of organizations on leadership.*

John Crawford is a senior lecturer in the School of Management at the University of Technology, Sydney, and has taught organizational behavior and research methods. He obtained his PhD from the University of New South Wales on the study of mental abilities and human performance. His research interests are in the general area of organizational behavior, and include leadership, teamwork, and business ethics.