INTRODUCTION

European and national policymakers, employers, employees and ‘work-life balance’ scholars often view home-based telework (HBT) as a work-life arrangement that has the potential to harmonise employees’ professional and private lives. HBT refers to working at home during at least part of employees’ contractual working hours, usually mediated by information and communication technology (Nilles 1998). Through HBT employees can save commuting time (Ory and Mokhtarian 2006) and gain more time sovereignty (Van Sell and Jacobs 1994; Tremblay 2002:164), perhaps leaving more time and energy for family and leisure activities (France et al. 2002).

Since the 1990s, the percentage of teleworkers in the Netherlands has increased tremendously, putting the country at the European forefront (Gareis 2002; Van Klaveren et al. 2005). By 2003, about 70% of the larger Dutch firms allowed (part of their) personnel to work from home, mostly part of the contractual working time. This was arranged for either formally (14%) or informally (55%) (Peters and Batenburg 2004). Interest in HBT is high among Dutch workers. A large-scale cross-national study in 2002 showed that about three-quarters of the Dutch working population indicated being interested in some type of telework (Gareis 2002). The study also revealed that 20.6% of the Dutch employed population does telework already; this includes those working from home less than one day (11.6%) and one day or more per week (9%).
Although many stakeholders view HBT as a promising strategy to harmonise work and life, a growing teleworkability of professional tasks does not guarantee a further breakthrough of telework into employees’ daily lives. From the existing literature it is clear that not all job categories or all individual employees have equal access to HBT (Peters and Batenburg 2004). Teleworkers are most likely to be knowledge workers – like policymakers, managers and professionals – higher-educated and males (Bailey and Kurland 2002). In the present study we argue that managerial aspects such as coordination, control and trust problems play an important role. Telework policies may relate to job categories, to individual workers, or to both. Assuming that working from home is often a voluntary employee strategy, it is also not known beforehand who is in power to deal with employees’ telework requests. About half of the larger Dutch companies (51%) indicate top-management as having the power of decision regarding who can telework or not (Peters and Batenburg 2004). In 44% of the teleworking organisations this power is in the hands of lower-level management, including direct supervisors (ibid.). Therefore, it is not unthinkable that organisations also make telework decisions at the individual level. In fact, in many organisations top managers are not aware of the existence of telework practices in their companies, let alone who has access to it, especially since this is often arranged informally (Van Klaveren et al. 2005). The present study aims to further analyse which factors affect employees’ access to structural (weekly) HBT by looking into work traits at two levels: job category and individual employee. But what are the underlying mechanisms that can explain differences in formal or informal access to HBT? What job category and individual worker traits do managers take into account (implicitly or otherwise) when making decisions on who has access to HBT? In the present study, these questions will be approached from a combined economic and sociological perspective, and theoretical viewpoints will be linked to insights from the literature.

THEORY AND HYPOTHESES

Introduction

Next to a lack of information on telework (Illegems 2001), the literature also points to a lack of interest in and even resistance towards telework among managers (Bailey and Kurland 2002). According to the disruptiveness theory (Powell and Mainiero 1999), managers’ reluctance regarding work-life balance arrangements like HBT results mainly from their expectation that alternative work arrangements will complicate their own work. Managers are said to anticipate problems with regard to the management and coordination of work activities, and the control of work activities when their subordinates are not simultaneously present (Nilles
Coordination and control problems are expected to play an important role with regard to who can telework. This question has similarities with make-or-buy decisions that are studied from a transaction costs approach (Williamson 1985; Batenburg et al. 2003; De Ruijter and Van der Lippe 2006). The transaction cost approach is taken as a starting point in this study too. The importance of trust is emphasised in relation to the control problem. Trust can be viewed as the core issue of telework management (Nilles 1998; Huws et al. 1990; European Commission 1999; Harrington and Ruppel 1999). Whereas transaction cost theory focuses primarily on the characteristics of the employment relation itself, New Economic Sociology (Granovetter 1985) points out the importance of the social embeddedness of the employment relation as a way to generate trust. Therefore, this theory will be added to the explanation. In the following, these two theoretical approaches will be further explained and our three main hypotheses developed.

The problem potential

Transaction cost theory focuses on the management of an economic relation between two parties. Every economic transaction engenders a particular ‘problem potential,’ i.e. the odds of unwanted outcomes. Before a trustor agrees to a transaction, he will make an estimation of the magnitude of the costs that are involved to reduce the problem potential, such that the risk associated with the transaction will be acceptable (Batenburg et al. 2003). The magnitude of these transaction costs depends on the size of the problem potential. On the one hand, the problem potential depends on the risk and consequences of predictable and unpredictable contingencies (coordination problems); on the other, it depends on the odds and consequences of opportunistic behaviour of the trustee (control problems) (Batenburg et al. 2003). Since transactions with a higher problem potential induce more costs, organisations will be more likely to choose for a more hierarchical governance structure that allows closer coordination and control. With respect to the choice for teleworking, which can be viewed as a hybrid type of ‘make-or-buy decision’ (since employees work away from the central office), organisations will be led by the problem potential of teleworking, and hence by the associated costs. A straightforward application of transaction cost theory to our research problem would suggest that a high problem potential of certain employment relations implies an organisation is less likely to allow a job category or individual employee to telework. However, the choice for telecommuting can be viewed as a new contract added to an existing employment relation, the associated risks having been reduced or already accepted by the organisation. In order to understand differences in telework opportunities we should rather consider any additional problem potential associated with teleworking, as employers will probably be more
inclined to allow employees to telework when the (perceived) additional problem potential is relatively low.

Coordination problem hypothesis

Employers may be more reluctant to allow teleworking when severe coordination problems are more likely. Existing coordination problems are even assumed to accrue when work is performed at a distance. Job activities may vary with respect to potential (additional) coordination problems. Some job activities demand frequent and often unpredictable contacts between co-workers, managers or clients. When workers highly depend on each other’s input, knowledge and skills, i.e. when their assistance is required often, employees need to be accessible. Teleworking may easily lead to a loss of communication, accessibility, feedback and information exchange. The coordination problem will also depend on the extent to which activities can be planned. Unexpected contingencies, like rush jobs, can disturb the work process, often requiring managers and individual workers to reorganise their tasks. When employees have supervisory tasks, the potential coordination problem may be severe too. Telecommuting may not only affect their own job performance, but also that of their subordinates. Especially since it is their job to facilitate, coordinate, motivate and control the work of others, their physical absence may bring about problems, such as challenging opportunistic behaviour of subordinates or failing tasks due to a lack of supervision and feedback.

Given transaction cost theory’s assumption that a larger (additional) coordination problem demands higher transaction management in order to reduce the telework risk, it can be expected that job categories and individual employees whose work activities can be characterised by a small (additional) coordination problem are more likely to have access to telework than others. More concretely, employees with access to HBT are expected to be found more often amongst job categories or individual employees whose work is either less likely to be interrupted for consultation and by unexpected contingencies, or amongst employees without supervisory tasks.

Control problem hypothesis

When it comes to certain job categories or individual workers, controlling the work process directly is always problematic, regardless of whether the work is being performed at the regular workplace or at home. The additional risk associated with telework may therefore be relatively small. High-grade knowledge work, for example, requires intense levels of concentration and creativity that cannot be enforced by strict, direct control. This type of work requires a certain amount of freedom. Close supervision may even affect creativity and productivity negatively.
Besides, even in a regular workplace situation, certain job categories and individual employees are used to a high degree of freedom. Their sovereignty may apply in terms of scheduling freedom (‘when the work is done’) or degree of job control (‘how the work is done’ in terms of order, method and speed of doing things). With job categories and individual workers that have more time sovereignty and job autonomy already, employers always face a high, but obviously acceptable, trust problem. Mobile workers performing their tasks away from the regular workplace, sometimes using online connections during business trips or in the field, also experience a relatively high level of freedom. When the existing direct control problem of job categories and individual workers is reduced by exercising output control – meaning that they are controlled and rewarded on the basis of their results (task orientation) rather than on actual ‘face hours’ at work (time orientation) – the additional risk potential of telework is relatively small.

Here the expectations for access to telework are the same as for the coordination problem hypothesis. Employees with access to HBT are expected to be found more often amongst employees who have flexible working hours, who have more job autonomy (including mobile workers and higher-educated workers) and who are managed on the basis of output.

Dyadic embeddedness hypothesis

Telework decisions are embedded in an existing employment relation. A long-term dyadic embeddedness may imply that, on average, employees can be considered more trustworthy and thus more likely to be allowed to telework. The dyadic embeddedness has two components: the history of the current work relation (often referred to as the ‘shadow of the past’) and the future expectations (‘shadow of the future’) (Batenburg et al. 2003). A longer work history provides employers the opportunity to judge better whether an individual is suitable for telework (Buskens and Raub 2002). Selecting employees for telework might be viewed as a form of ex ante control (Hales 1993) that reduces the trust problem (Nilles 1998; Sparrow and Daniels 1999). Employees’ future expectations about the employment relation may provide the employer with some control options (Buskens and Raub 2002). In this respect, the type of job contract may play a role. Two trust problem-reducing mechanisms might be possible: if the future job tenure is expected to be relatively long and/or the employee has good career opportunities, the reciprocity of interests of employer and employee may generate trust and loyalty (Batenburg et al. 2003), reducing the trust problem. Alternatively, a temporary contract can also reduce the trust problem since it allows an employer to sanction employees’ opportunistic behaviour by not extending the employment relation. This can be viewed as a form of ex post control (Hales 1993).

To summarise, there is a twofold reason to add the dyadic
embeddedness of the employment relation to the explanation of employees’ access to HBT: a long work history with the current employer may reduce the trust problem and increase employees’ likelihood of being given access to telework. With respect to the type of labour contract, our expectation is not directed.

DATA, OPERATIONALISATION AND METHOD

Data

In 2003, unique multi-actor data were collected from 1,114 employees working in 30 organisations spread over 89 job categories. The data collection was part of a larger NWO research program entitled Time Competition: Disturbed Balances and New Options in Work and Care (Van der Lippe and Glebbeek 2004). The research design comprised various types of questionnaires. For purposes of this study, four were used: a written organisation questionnaire filled out by the HRM department; a written questionnaire for each single job category filled out by the manager related to the job category under study; a written employee questionnaire; and an extensive set of structured questions that were asked in a face-to-face interview with the employee at home.

The dependent variable

Employees were asked whether they were given weekly access to HBT. Based on their answers, a dummy variable was constructed (1 = yes, I do have weekly access to HBT). Noteworthy is that telework was explicitly not equalled to doing work at home after working hours – paid or unpaid. Descriptive analysis shows that 28% of the employees in our data set had access to weekly HBT (see Table 14.1 for descriptive analyses of all variables used).

The independent variables

Coordination problem hypothesis

• Potential work interruptions
  These were measured at two levels, i.e. the job category level and the individual employee level, using almost the same set of propositions, on a five-point scale. Managers were asked for traits of job-holders in the particular job category they are responsible for. For example, managers were asked to respond to a proposition saying that ‘employees are often interrupted during work’. At the other end of the continuum it is stated that ‘employees can work for long hours at a stretch’. Other items in the scale concern unexpected contingencies, rush jobs, work
interference due to mutual consultations, and interrelated work activities of employees. At the job category level, five items were used (alpha=.69). At the individual employee level, six items were used (alpha=.69). A higher score on the coordination problem scale indicates a lower telework risk. Strikingly, the two scales were significantly (p<0.001) but not highly correlated (.14).

- Supervisory tasks
  Having supervisory tasks was measured by asking individual employees whether they have supervisory tasks, and if so, how many subordinates they are supervising. On the basis of these questions, a dichotomous variable was constructed (1= yes, I do have supervisory tasks).

**Control problem hypothesis**

- Time sovereignty
  We inquired about time sovereignty at both the job category and the individual employee levels. At the job category level, managers were asked how employees' working hours are controlled: if they are not controlled by direct supervision or by technical means such as a time clock, employees are considered to have a high degree of time sovereignty. At the individual level, employees were asked whether they have a fixed schedule. On the basis of their answers, a dichotomous variable 'no fixed schedule' was constructed (1= no fixed schedule). Employees could also indicate on a five-point scale to what extent they were in control of their personal working hours. A high score implies a high degree of time sovereignty.

- Job autonomy
  Job autonomy was measured at the job category and individual employee levels. Measurements vary. At the job category level, eight items on a five-point scale were used. Job autonomy refers to employees' freedom with respect to working hours, pace, planning, order and style, job content, cooperation and quality assessment (alpha=.84). At the individual level, three items for job autonomy on a five-point scale were used (.69). These items refer to employees' individual freedom and say with respect to doing the job (Bakker et al. 2003). A high score represents a high level of job autonomy. The presence of mobile tasks at the job category level is measured by a dichotomous variable (1= yes, mobile workers present in this job category). In addition to these measurements, the educational level of the employee is taken into account as an indication of a high level of job autonomy of high-grade knowledge workers. The correlation between access to weekly HBT and educational level is relatively high (r=0.39).

- Output-related rewards
  Output management was measured at the job category and individual
employee levels. At the job category level, managers were asked whether employees were given a bonus related to their individual, group or organisational performance. On the basis of their answers, a dichotomous variable ‘output related rewards’ was constructed (1 = yes, employees are rewarded on an output basis). At the individual employee level, employees were asked to respond to the statement on a five-point scale stating that ‘I am rewarded on the basis of a certain amount of returns or output’, not necessarily referring to financial rewards. A high score refers to employees’ perception of output-related rewards.

Dyadic Embeddedness Hypothesis
The influence of the dyadic embeddedness hypothesis was measured at the individual employee level by two factors: number of years with current employer and temporary versus fixed contract (dichotomous variable: 1 = permanent contract).

Control variables
To control for other influences that are likely to affect employees’ access to HBT, several control variables were taken into account. First, managers’ telework attitude was measured at the job category level, asking managers to respond to 11 propositions (Cronbach’s alpha=.75), even when no teleworkers were present in the particular job category. The items relate to consequences of HBT, like (expected) productivity gains, co-worker cooperation and organisational commitment. A high score on the attitude scale implies managers are well-disposed towards HBT. Second, the branch in which an organisation operates may affect telework decisions. A distinction is made between private companies, public organisations and non-profit organisations. In the analyses the non-profit organisations were used as a reference category. Third, the organisation questionnaire allows us to control for size of the organisation. Due to economies of scale, larger organisations may have lower transaction costs per individual teleworker, and are more likely to allow their employees to telework (Peters and Batenburg 2004). Fourth, and in the same vein, organisations with a higher percentage of highly educated workers, whose work is more likely to be teleworkable, will more probably have introduced teleworking (Peters and Batenburg 2004). Fifth, the influence of the technological teleworkability of individual employees’ jobs is taken into account. The frequent use of a personal computer and e-mail may be viewed as indicators of technical teleworkability. Sixth, the gender of the individual worker is used as a control variable. Seventh, the number of contractual working hours is controlled for.
Method

Multivariate logistic regression analysis is used to test our hypotheses. Since the employees in our sample are all clustered within 30 organisations, a multi-level model will be tested. As employees within a particular job category are not necessarily working in the same department, job category will not be considered a level in the multilevel model. Consequently, only two levels are distinguished: employee and organisational. Since our main hypotheses are directed, tests will be one-tailed. The multivariate analysis applies (after listwise deletion) to 945 employees.

RESULTS

We will now present the results of the multivariate analyses.

Coordination problem hypothesis

The coordination problem hypothesis is only partly corroborated. The chance of work interruptions only appears to be a significant factor at the job category level. Employees in job categories whose work is less likely to be interrupted (e.g. due to consultation, rush jobs, or waiting for necessary input from others) are more likely to have access to telework. At the employee level, neither the (experienced) chance of work interruptions nor employees having supervisory tasks are shown to be significant factors. Obviously, access to teleworking is affected more by managers’ perception of potential coordination problems than by individual workers’ shop-floor experiences.

Control problem hypothesis

Generally speaking, the results of the multivariate analysis are supportive of the control problem hypothesis. Flexible working hours at the job category and individual employee levels have positive effects on telework opportunities. Strikingly, autonomy as a job category trait does not predict an individual worker will have access to telework, whereas as an individual job trait it does. In contrast to the coordination problem, the decision to allow employees to telework is less likely to be affected by job group characteristics and more by the level of job autonomy an individual worker is given. The educational level of the individual worker, seen as an indicator of more individual job autonomy, is also shown to be an important factor in employees’ telework opportunities. In line with expectations, job categories and individual workers who are rewarded on the basis of output (individual, group or organisational) appear to be more likely to have access to telework than others. The trust problem
associated with telework is clearly reduced by output control, hence the telework opportunity is more likely to be given. When tasks in a job category also include mobile work activities, all employees are more likely to have access to HBT. By definition, mobile workers performing work activities away from the central office have to be trusted. Allowing mobile workers to work from home outside of their external job activities is likely to be much more efficient and time-saving, and thus more productive.

Dyadic embeddedness hypothesis

As expected, the number of years with the current employer appears to be a factor in employees’ access to telework. A long work history obviously generates trust, reducing the need for investing in telework management. Having a temporary contract does not affect employees’ access to telework. The controlling effect of a temporary contract that was believed to increase employees’ chances of access to telework is possibly outbalanced by the positive effect of a fixed contract, which was believed to commit workers. The dyadic embeddedness hypothesis could therefore be supported only partially by our data.

Control variables

Employees working in job categories in which managers are well disposed towards telework are shown to be more likely to have access to telework than others (all else being equal). This suggests that not only the trust problem itself, but also the risk managers are willing to take determine employees’ telework opportunities. Employees in the non-profit sector are no less likely to have access to telework. No systematic differences across branches are found when a different reference category is chosen. In line with expectations, organisational size and percentage of highly educated workers amongst the personnel are shown to increase the likelihood of employees being allowed to telework. This may be attributable to economies of scale. The higher the number of potential teleworkers, the lower the costs of telework management per teleworker. Larger organisations may also be better equipped to handle rush jobs, since there are more employees doing the same type of work. Such organisations have larger budgets to spend on IT and helpdesk services, enabling information and communication exchange with teleworkers and thus reducing the potential telework risk. Technical teleworkability plays a role too. Employees who use e-mail frequently are more likely to work at home; this habit may indicate that employees already depend on others outside the organisation or that they are less dependent on face-to-face contact, therefore facing few (extra) coordination problems. The degree of PC use by the individual worker does not affect access to telework. Female workers are less likely to be given the telework option. The number of working hours has no effect on
employees’ telework opportunities.

The influence of the organisation

Only those characteristics such as size of the organisation and share of highly educated workers amongst the personnel are included in the analysis. Clustering by organisation does allow estimation of the share of other organisational factors in the unexplained variance. About 42% of the unexplained variance is shown to be attributable to the organisation. This share is significant (p<0.001). Obviously, not only job category and individual workers’ traits may be relevant but also organisational culture and environmental factors.

CONCLUSION AND DISCUSSION

The present study shows coordination, control and trust problems to be important factors in formal and informal telework opportunities. When selecting teleworkers, organisations and managers obviously consider the management costs associated with telecommuting. As such, this finding may not be very surprising. However, whether managers are led by general job traits, individual work characteristics, contextual factors, or by all these characteristics often remains unanswered. Given the differences in decision power across organisations, both levels were included in the explanation. Inspired by the insights of New Economic Sociology, we also focused on the social embeddedness of the employment relation.

With respect to coordination problems, it is interesting to see that the selection of teleworkers is not determined by the actual need for individual workers to be available at the shop-floor level for assistance, consultation or rush jobs. Instead, the telework decision is determined by the general picture the organisation or manager has of (potential) coordination problems of the job category as a whole. Three explanations can be given. First, the coordination problem might be viewed rather as a collective problem than an individual one, precisely because coordination problems affect not only the individual, but also others (e.g. colleagues and customers). This holds especially true when several employees work together in the same project. The decision to allow telework depends more on group characteristics than on individual job traits. Second, managers may allow telework only when the work of all employees in a function group is characterised by relatively few coordination problems. In this case, economies of scale make it more worthwhile to invest in telemanagement and IT infrastructure. Third, telework is often viewed as a strategy (by employers and employees alike) to escape the hectic office and to be able to work long hours without interruptions in order to meet deadlines (Peters et al. 2004). Employees experiencing many work-related interruptions may have negotiated telework with their supervisors.
at a bilateral level.

In contrast to the coordination problem, the control problem appears to play a role at both the job category and the individual employee level. Those job categories and individual workers that are more trusted in the regular work situation were also found to be more trusted when it comes to telecommuting. More concretely, employees whose time input was not as closely controlled were more likely to be given access to HBT. In the same vein, output-related reward systems, either introduced at the job category level or experienced by individual workers, were found to be capable of reducing the trust problem associated with teleworking. However, autonomy as a job category trait clearly does not convince organisations that each single employee is trustworthy to such an extent that telecommuting is possible without investing in telework management.

When employees are given a high degree of job autonomy at an individual level, they are also trusted with teleworking. Two explanations can be given. First, trustworthiness is viewed rather as a characteristic of an individual employment relation (employer-employee) than a relationship between an employer (manager or supervisor) and all employees in a job category. Second, employees who are allowed to telework might experience a higher level of autonomy in their job, regardless of them using the telework option (Peters et al. 2004).

From the present study we can learn that in order to understand who can telework, traits at both the job category and the individual employee level play a role, as does the embeddedness of the employment relation. Obviously, the social context can reduce the (experienced) problem potential. Generally speaking, mutual familiarity between individual workers and their employer organisations connotes increased employee trustworthiness. Hence, the new economic sociology perspective can indeed be considered to be complementary to the transaction cost theory.

Altogether, both the use of multi-actor data, allowing us to distinguish between general job traits and details of individual jobs, and the building of a comprehensive framework, allowing us to integrate the reported coordination and control (trust) problems into one theoretical perspective, can be viewed as adding surplus value to the existing literature. Of course, some aspects of access to teleworking have not been addressed yet.

First, our research showed the selection of teleworkers to also have a subjective component. A positive attitude of the manager towards (consequences of) telework reduces the trust problem experienced, regardless of the actual coordination and control problem associated with telework. This finding may be a point of departure for future national and organisational policies aimed at stimulating telework practices: information and positive image-building among organisations and managers are likely to stimulate a more equal access to telework.

Second, our basically economic approach did not focus on power and status issues. Still, our finding that highly educated workers had more
access to telework than others may be related not only to them doing high-grade knowledge work, but also to managers’ willingness to delegate power to their subordinates (Peters and Den Dulk 2003). Telecommuting and self-control used to go together with more authority, prestige and status, and were therefore traditionally inappropriate for subordinates (Van der Wielen and Taillieu 1994). Third, given that part of the unexplained variance in access to telework could be attributed to organisational factors, future research may also look into the organisational culture (Standen 2000; Peters and Batenburg 2004) or the organisational context, such as labour market conditions.

Finally, the content of telework requests may also influence who gets to telework. Our study showed female workers to be less likely to be given access to telework. This could be attributed to their motivation, as women may mention non-work-related issues in their telework requests more often, whereas men may emphasise the need for better concentration and meeting deadlines (Omari and Standen 2000; Peters and Den Dulk 2003). In view of employees’ combined daily problems, this issue needs further examination.

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Does telecommuting really save commute time? Time, distance, and speed evidence from State of California workers

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