Predicting teleworker success: an exploration of personality, motivational, situational, and job characteristics

Thomas A. O'Neill, Laura A. Hambley, Nathan S. Greidanus, Rhiannon MacDonnell and Theresa J.B. Kline

This study explored personality and motivational traits related to teleworker performance and satisfaction, including sociability, need for achievement and autonomy, diligence and organisation. Situational factors were also compared between teleworkers and non-teleworkers, such as number of children, job autonomy and job complexity. Implications for research and practice are discussed.

❏ Tom O'Neill (toneill7@uwo.ca) is completing a PhD in Industrial/Organizational Psychology at the University of Western Ontario. The ultimate goal of Tom's research programme is to uncover the personality profiles of successful (and unsuccessful) face-to-face and virtual team members, as well as those relevant to teleworking effectiveness. Laura Hambley (laura.hambley@shaw.ca) has a PhD in Industrial/Organizational Psychology from the University of Calgary. Laura currently works as a senior consultant with SPB Organizational Psychology. Her research focuses on virtual leadership/ teamwork and telework. She is interested in how virtual leaders can more effectively lead teams through different communication media. Nathan Greidanus (Nathan_Greidanus@umanitoba.ca) is Assistant Professor of Entrepreneurship at the Asper School of Business, University of Manitoba, Canada. His research interests include entrepreneurship, international business strategy and sustainable/economic development. Nathan's professional experience includes working in the investment banking industry, owning and managing two franchises, and running his own business development consulting company. Rhiannon MacDonnell (rmacdonn@ucalgary.ca) is currently completing her PhD in Management at the Haskayne School of Business at the University of Calgary. Rhiannon's recent research endeavours include a large study on Virtual Teams, as well as research seeking to create a personality-based selection measure for teleworkers in collaboration with Laura Hambley and others. Theresa J.B. Kline (Babbitt@ucalgary.ca) is a professor in the Department of Psychology at the University of Calgary. She has an active research programme in the area of team performance and her other research interests include psychometrics, organisational effectiveness, and work attitudes. She has an active organisational consulting practice with projects ranging from individual and organizational assessment to strategic alignment.

The impact of technology on individuals and organisations is widespread, and has resulted in the capability to do many jobs from anywhere at any time (Baruch and Nicholson, 1997; Cascio and Shurygailo, 2003; Manoochehri and Pinkerton, 2003). One type of work arrangement enabled by technological advancement is *telework*, which involves working away from the conventional workplace through the use of computer-based technologies. Telework may range from occasional to full-time, although it is often done on a part-time basis (e.g. one to two days a week; Harris, 2003; Steward, 2000).

When teleworkers work from their homes, and they use information and communication technology (ICT) to keep in touch with centralised work locations, they are frequently referred to as 'home-based' teleworkers. (e.g. Hotopp, 2002). Many organisations have introduced home-based telework as a potential way to increase the flexibility of work (e.g. IBM, Bell Canada, Nortel Networks; Edmonds, 2006). For example, telework has the potential to reduce the time, energy, and costs of commuting, as well as provide greater autonomy, independence, and job satisfaction (Gray *et al.*, 1993; Nilles, 1998). For these reasons, coupled with advances in ICTs, home-based telework has become increasingly common (Konradt *et al.*, 2001).

Despite its advantages, telework may not be a suitable work arrangement for all employees (Nilles, 1998; Manoochehri and Pinkerton, 2003). There are certain individual characteristics, such as the need for constant guidance and direct supervision, that may affect a person's ability to be productive at home. Although some researchers have emphasised the need to select teleworkers carefully (e.g. Baruch and Nicholson, 1997; Harpaz, 2002), recent semi-structured interviews conducted at 14 organisations found that little is known about how to select the most suitable employees for telework (Verbeke *et al.*, 2008).

There is a tremendous amount of research and meta-analytic evidence demonstrating that personality traits consistently predict job-related outcomes (e.g. Barrick and Mount, 1991; Tett *et al.*, 1991; Salgado, 1997; Hurtz and Donovan, 2000; Judge *et al.*, 2002). Moreover, motivational traits, such as Need for Achievement and Need for Autonomy also show promise as predictors of work effectiveness (e.g. Steers and Braunstein, 1976; McClelland, 1985; Miner *et al.*, 1994; Wright *et al.*, 1995). To date, empirical studies examining the relationship between these predictors and *telework* effectiveness have, to our knowledge, not been conducted. It can be reasoned, however, that personality traits are differentially related to job effectiveness depending on whether one works in a traditional or telework setting. For example, people who are gregarious and outgoing may not be expected to do well in a telework position because they may not have access to the social interactions they enjoy (cf. Weisenfeld *et al.*, 2001).

Given the increasing emphasis on telework in organisational settings, research is sorely needed to compare the traits needed to effectively work in the office versus in the home (via telework). We focused on telework in the home, as opposed to the broader conceptualisation of telework that includes telework from remote offices, to hone in on issues specific to home-based telework. For example, the argument that telework is more likely for employees who have children holds for teleworkers working from home but not necessarily for those working from a remote office outside the home.

Taken together, the primary purpose of the present study was to assess the relations between personality and motivational traits and job effectiveness in teleworkers versus non-teleworkers. Specifically, we compared the predictive validity of personality and motivational traits on both teleworker and non-teleworker effectiveness. In this study, we operationalised 'effectiveness' as job satisfaction and self-rated performance.

A second purpose was to determine *who* is more likely to telework given their situational status. That is, we compared teleworkers with non-teleworkers to determine what, if any, situational factors (e.g. number of children living at home) might differ among these groups. Finally, we also assessed differences in job characteristics (e.g. work autonomy) to better understand which jobs organisations tend to relegate to telework. Combined with personality and motivational traits, situational variables and job characteristics may provide valuable information for organisations seeking to maximise positive telework outcomes.

Literature review and hypotheses

As mentioned, teleworker effectiveness, for purposes of this research, is operational-ised by the constructs of job satisfaction and self-rated performance. To determine predictor variables that could differentiate teleworkers from non-teleworkers on these two variables, we first turned our attention to the current telework literature (e.g. Shamir and Solomon, 1985; Daniels *et al.*, 2000; Bailey and Kurland, 2002; Raghuram and Wiesenfeld, 2004; Golden *et al.*, 2006; Schweitzer and Duxbury, 2006). We found that the predictors of teleworker success tend to fall into the following three general categories: (1) ability to separate work from non-work life, (2) working without close supervision, and (3) overcoming threats of isolation. In an attempt to assess the traits involved in differentiating teleworker from non-teleworker effectiveness, we carefully selected a number of trait measures that were theoretically related to at least one of the above general categories. That is, based on the results of our literature review, we searched for traits where we could develop a compelling theoretical argument to suggest that a given trait would be *more* predictive of telework effectiveness versus non-telework effectiveness.

We drew personality and motivational constructs from both the HEXACO Personality Inventory (HEXACO PI; Lee and Ashton, 2004), and the Manifest Needs Questionnaire (MNQ; Steers and Braunstein, 1976), which are each described in detail shortly. The resulting list of traits was then truncated to restrict substantial overlap among traits included (overlap creates redundancy in theoretical arguments, survey items and statistical analyses). Although the likelihood of the traits selected will tend to fluctuate across jobs, our view is that, on average, the traits selected ought to be related to teleworker success more so than for non-teleworker success.

Personality traits

The HEXACO-PI is a personality inventory designed to measure six major dimensions of personality that were derived from lexical studies of personality structure. Specifi-cally, the HEXACO measures the Big Five factors of personality (i.e. emotionality, extraversion, agreeableness, conscientiousness and openness to experience) plus a sixth factor not well represented by the Big Five, namely, honesty-humility. The psy-chometric properties including concurrent and discriminant validity of this measure have been extensively documented (see Lee *et al.*, 2003; Boies *et al.*, 2004; Lee and Ashton, 2004; Ashton and Lee, 2005). In line with a criterion-oriented approach (see Schneider *et al.*, 1996), we selected those traits that were conceptually linked to the criterion of interest. From the six personality factors measured by the HEXACO model of personality, two facets of conscientiousness (i.e. organisation and diligence) and one facet of extraversion (i.e. sociability) were deemed the most relevant to the present study.

Organisation. The trait labelled 'organisation' assesses the tendency to seek order, particularly in one's physical surroundings. High scorers on 'organisation' prefer a structured approach to tasks, whereas low scorers tend to be more sloppy and hap-hazard.

One of the difficulties of working remotely is adapting to the lack of structure. As Bell and Kozlowski (2002) noted, the virtual work environment is extremely ambiguous and requires self- or leader-imposed structure to facilitate success. A reasonable asser-tion, therefore, is that teleworkers scoring higher on organisation would be better at teleworking because they create self-imposed work schedules, coordinate their tasks with others, and maintain a systematic approach to completing work activities. For these reasons, organisation may be even more important for teleworkers than non-teleworkers. Accordingly, we posited the following:

> Hypothesis 1: Organisation will be positively related to teleworker and non-teleworker effective-ness, but the effect will be stronger for teleworkers.

Diligence

Another facet of conscientiousness is diligence, which is the tendency to work hard and persist on tasks. Individuals who score high on diligence have a strong 'work ethic' and are willing to exert themselves. Individuals high on diligence were expected to be better able to separate their work from non-work life. Because these individuals work hard and are highly disciplined, they may be less prone to distractions by non-work issues (e.g. television) commonly associated with teleworking. Indeed, Ellison (2004) found that some teleworkers attend to non-work activities during regular office hours such as 'surfing the Internet' or answering phone calls from friends or relatives. However, it can be argued that employees scoring high on diligence will remain focused on the tasks at hand and will be more likely to keep interruptions to a minimum, thereby using their telework days to maximise productivity.

Teleworkers scoring higher on diligence may have the further advantage of being able to function better under minimal supervision than those who are less diligent. Given that telework is associated with reduced supervision (Batenburg and Peters, 2005), highly diligent teleworkers may perform better in this work arrangement because they are intrinsically motivated to work hard regardless of the level of supervision. Thus, this trait may be a more important predictor of telework than non-telework effectiveness.

> Hypothesis 2: Diligence will be positively related to teleworker and non-teleworker effectiveness, but the effect will be stronger for teleworkers.

Sociability

Sociability assesses one's tendency to enjoy conversation, social interaction, and parties. People high in sociability enjoy talking, visiting and celebrating with others.

Sociability should have an inverse relationship with telework effectiveness because those who are highly sociable are expected to feel more socially isolated when teleworking. Isolation has been emphasised repeatedly as a limitation of telework (e.g. Harris, 2003). Empirically, Fireman (1998) found that the need for community (social interaction) positively predicted withdrawal from teleworking arrangements. Further, Gray *et al.* (1993) noted that an ability to cope with minimal social contact is necessary for effective telework, and Manoochehri and Pinkerton (2003) reported that teleworkers often feel socially and professionally isolated. Taken together, these propositions suggest that sociability may be an undesirable trait for teleworkers because their working environment contains fewer opportunities for interpersonal interaction.

Clearly there exists less of the 'human element' in telework. Thus, it is plausible that individuals who more strongly desire human contact—those who are highly sociable—will miss the face-to-face interaction with co-workers, and will more likely be dissatisfied and report lower job performance. For non-teleworkers, however, it is likely the case that Sociability contributes positively to job effectiveness in contexts where social interactions are an important part of the job. In jobs with limited social interaction, sociability is expected to be negatively related to effectiveness. In sum, for non-teleworkers Sociability may be positively, negatively or unrelated to effectiveness, depending upon the job in question, so overall we predict it to be unrelated.

> Hypothesis 3: Sociability will be unrelated to effectiveness for non-teleworkers and negatively related to effectiveness for teleworkers.

Motivational traits

The MNQ contains items designed to measure four different need motivations: achievement, affiliation, dominance and autonomy (Steers and Braunstein, 1976). In the present study, we were interested in two of these motivational traits that relate conceptually to telework: (1) need for autonomy and (2) need for achievement.[1]

Need for autonomy

The need for autonomy scale assesses a person's need to work without direct supervision by working alone, controlling their own work pace, and not being hampered by excessive bureaucracy (Birch and Veroff, 1966). People scoring higher on need for autonomy prefer to set their own hours, be their own boss, and plan their own work schedules. Several authors have argued that need for autonomy is an important trait for effective teleworking (e.g. Gray *et al.*, 1993; Konradt *et al.*, 2003). This trait is more congruent with telework than non-telework because remote workers are generally expected to work without direct supervision, and set their own schedule and method for getting things done (Harris, 2003). In non-telework settings, however, need for autonomy may be positively, negatively, or unrelated to effectiveness depending on the autonomy inherent in the job. Thus, we predicted the following:

> Hypothesis 4: Need for autonomy will be unrelated to effectiveness for non-teleworkers and positively related to effectiveness for teleworkers.

Need for achievement

According to McClelland (1985), individuals high on need for achievement have a strong desire to achieve high performance on challenging tasks. There are reasons, however, why Need for Achievement may be negatively related to teleworker effectiveness. First, teleworkers may be unlikely candidates for promotion because they are less physically visible than non-teleworkers (Illegems and Verbeke, 2003). Thus, they may not receive the recognition they deserve for their work, leading to feelings of resentment and potentially decreased effectiveness. Second, high scorers on need for achievement have a strong tendency to seek concrete feedback (McClelland). Feedback in a remote work setting, however, may be less frequent and more ambiguous than feedback in face-to-face environments (Bell and Kozlowski, 2002).

In terms of non-teleworker job effectiveness, the effects of need for achievement are well documented (e.g. Amyx and Alford, 2005). In general, need for achievement is linked to increased effectiveness, typically because these individuals set high goals for themselves (Phillips and Gully, 1997). Taken together, we propose the following hypothesis:

> Hypothesis 5: Need for achievement will be positively related to non-teleworker effectiveness and negatively related to teleworker effectiveness.

Situational factors that differentiate teleworkers from non-teleworkers

In addition to personality/motivational traits, an exploration of the situational characteristics that differentiate teleworkers from non-teleworkers may shed light on the conditions under which organisations are most prone to using telework. This information may have important organisational implications for the recruitment, selection, training and development of teleworkers.

Children

For some employees, telework has the *potential* to provide increased job flexibility (Standen, 2000). For example, those who have children living at home may find telework arrangements advantageous (Haddon, 1992). This is because, in some organizations, certain jobs are suitable for telework in that they may allow employees to simultaneously manage demands of work with those of the family, such as school, health care and illness. Note that this will not be the case with every job, but, on average, it is likely that telework will help more than hinder the juggling of work and family responsibilities. These suggestions are supported by reports that workers will accept decreases in pay and working conditions in exchange for the flexibility of working from home so they can better balance work with family responsibilities (Phizacklea and Wolkowitz, 1995). Thus, we predict that those with children living at home will *tend* to be attracted to telework arrangements more than will those without children at home.

Hypothesis 6: Teleworkers are more likely to have children living at home than are non-teleworkers.

Organizational tenure

For telework to be effective, managers of teleworkers need to trust their subordinates (Omari and Standen, 2000). Trust, in this sense, refers to 'the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party' (Mayer *et al.*, 1995: 712).

Trust is important because the managers who supervise teleworkers need to firmly believe that their subordinates will carry out their work effectively when they are 'out of sight' (Batenburg and Peters, 2005). Such trust is likely to develop and crystallize only after a period of time. Thus, all else being equal, employees new to the organisation would probably not be trusted as much as those with greater tenure.

Furthermore, organisational newcomers are more likely to be inexperienced with the job, or at least with how the job is done in the particular organisation. As Nilles (1998) noted, transitions to teleworking arrangements are more successful when people possess the skills and experience to 'get the job done' independently. Taken together, employees with greater organizational tenure would likely be more trusted, and be more knowledgeable and experienced with how work is done in a particular organisation. If this assumption is correct, organisational tenure should be greater among teleworkers than non-teleworkers. Indeed, Schweitzer and Duxbury (2006) found that teleworkers tend to have greater organizational tenure than non-teleworkers. In line with the rationale presented, we propose the following hypothesis:

Hypothesis 7: Teleworkers are more likely to have longer organisational tenure than non-teleworkers.

Differences in job characteristics between teleworkers and non-teleworkers

Whether a person teleworks will likely be related to the characteristics of his or her job. Approximately two thirds of all jobs are deemed amenable to telework, at least on a part-time basis (Electronic Commerce and Telework Trends project, 2005). This estimate was based on the assumption that any computer- or deskwork-related task within a given job could be performed at a distance (i.e. home-based jobs that use ICT). While such a job-task breakdown is useful in estimating potentially teleworkable jobs, we contend that finer-grained predictors of telework job suitability will be found in the job characteristics of job autonomy and job complexity.

Job autonomy

As described in the literature review and in our discussion on need for autonomy, telework appears to lend itself to jobs requiring less supervision (Manoochehri and Pinkerton, 2003). Batenburg and Peters (2005) cited a conceptual model developed by Lamme (2000) that highlights the role of work autonomy as a criterion for determining jobs suitable for telework. They assert that jobs with the *potential* for autonomy are more likely to be suitable for telework. For example, white-collar administrative positions with relatively low levels of interdependence were suggested to be amendable to telework (e.g. accountants, insurance agents; Batenburg and Peters, 2005). These jobs are generally composed of a broad array of tasks, allow for individual control of work pace, and do not require a great deal of face-to-face interaction between members of the organisation (Bailey and Kurland, 2002). Thus, organisations may be more likely to permit telework in jobs that can be performed successfully with high levels of autonomy. In line with this reasoning, we extend the following hypothesis:

Hypothesis 8: Teleworkers will have more autonomous jobs than non-teleworkers.

Job complexity

As a job increases in complexity, feedback becomes increasingly important for task completion. The need for feedback is likely to be amplified when jobs are also highly

interdependent, as would be the case for a group of software engineers developing a new product together (e.g. Cramton and Webber, 2005). However, feedback is more difficult to obtain when work is being conducted away from the office (Baruch and Nicholson, 1997). For example, spontaneous interactions in on-site locations permit brief exchanges of knowledge that are not as available to home-based workers (e.g. the 'water cooler' discussion; Thompson and Coovert 2006). Because spontaneous communication is more restricted when work is performed at a distance, jobs high in complexity are not likely to be suitable for telework, especially if they are interdependent. In contrast, jobs lower in complexity such as those described earlier (e.g. administrative) may be more appropriate for telework because they are largely independent and constant feedback and collaboration is not required. Based on this discussion, we propose the following:

Hypothesis 9: Teleworkers will have less complex jobs than non-teleworkers.

Method

Participants

A sample of 156 employees, 62 males (39.5 per cent) and 95 females (60.5 per cent), from eight organizations in a large western Canadian city participated in this study. The eight organizations from which the sample was drawn varied in size (from 23 to 12,000 employees; $M = 2,162$), ranging from small entrepreneurial firms to large multinationals, and varied in organization type, ranging from private companies to government organisations. Participants' ages were broadly distributed ($M = 41.74$; $SD = 9.79$), and on average participants had 22.4 ($SD = 9.56$) years of work experience. Thirty-one per cent of the sample reported being in a supervisory/managerial position, and the mean hours worked per week was 44 ($SD = 8.73$). Twenty-three percent of participants had earned at least a college diploma, 41.9% had at least a Bachelor's degree, and 15.5 per cent had a Master's or PhD.

Within the sample of employees, 78 were teleworkers, and 78 were non-teleworkers. Participation in this study was extended across employees of the various organisations, regardless of whether they teleworked. Participation was completely voluntary, and those who participated and were not teleworkers likely had some interest or curiosity in the topic. In summary, both non-teleworkers and teleworkers voluntarily chose join the study. All teleworkers reported that they teleworked at least one day per month. Thirty-seven per cent of teleworkers did so on a full time basis, whereas the mean frequency of telework among participants was nine days per month.

Procedure

Human resource managers from a convenience sample of 27 organisations were contacted to assess their organization's interest in participating in the study. Eight organisations expressed interest in the study, providing an organisational response rate of 29.6 per cent. The participating organisations informed employees of the study and employees volunteered to attend a telework seminar and complete the survey. Telework seminars were coordinated by the second author of this paper as well as a researcher involved in a related study. The seminars were scheduled for 75 minutes and were conducted for two purposes: (1) to help the sample of current and potential teleworkers obtain a better understanding telework and its many impacts (and offer useful take-away tips and hints on how to telework more effectively), and (2) to have a facilitated discussion amongst participants to understand their thoughts/reactions to telework. Seminars included a brief description of the definition of telework, a roundtable discussion on the positive and negative impacts of telework, and a brief overview of 'best practices' to assist in implementing telework. Surveys were completed before the focus group discussions so as not to bias the research results.

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*Table 1: Self-reported performance and satisfaction items for teleworkers
and non-teleworkers*

	Teleworkers	Non-teleworkers
Performance	My performance when Teleworking is excellent	Overall, my job performance is excellent
Satisfaction	Overall, I am satisfied while Teleworking	Overall, I am satisfied with my current job

Measures

Personality characteristics were measured using subscales from both the Manifest Needs Questionnaire (MNQ; Steers and Braunstein, 1976) and the HEXACO-PI (Lee and Ashton, 2004). The selected subscales included organisation, diligence, sociability, need for achievement, and need for autonomy, each of which was selected on the basis of being germane to predicting perceptions of teleworker performance and job satisfaction. The HEXACO-PI has high internal consistency reliabilities and strong concurrent validities with external variables (see Lee and Ashton, 2004; 2006) for a thorough description of the development and psychometric properties of this measure). Regarding the HEXACO-PI, the four item scales of organisation, diligence (facets of conscientiousness), and sociability (facet of extraversion) were assessed, with Cronbach's alphas equal to 0.64, 0.53, and 0.71, respectively. For the five-item MNQ scales, the Cronbach's alphas for need for achievement and need for autonomy were 0.69 and 0.70, respectively.

Situational information was captured using three items. These items asked 'what is the (1) number of children at home younger than age 5; (2) number of children at home between the ages of 5 and 17; and (3) number of months you have worked in this organization. Job autonomy and complexity were measured on a 7-point Likert-type scale with single items. Job autonomy was measured with the item 'there is a lot of autonomy (freedom) in doing my job', whereas job complexity was recorded with the item 'my job is quite simple and repetitive'. The latter item was reverse keyed meaning that higher scores reflect lower job complexity.

To measure effectiveness, one item assessed self-rated performance and another measured satisfaction, both of which were rated on a 7-point Likert-type scale. As the teleworker group did not work remotely all the time, we attempted to avoid confounding their performance and satisfaction at work versus at home. To do so, for the teleworker group, we used items that asked about satisfaction and performance *when teleworking only*. For the non-teleworker group, we used global job satisfaction and performance items. Table 1 contains the items used to assess self-rated performance and satisfaction for teleworkers and non-teleworkers.

Results

Prior to testing the hypotheses, differences between the eight organisations were examined for all predictor and all criterion variables using nine separate one-way analyses of variance. Significant differences would suggest the need to control for the organisation at which participants were working in the tests of hypotheses. However, no significant differences were found. Accordingly, we followed Becker's (2005) suggestion to present the most parsimonious analyses; that is, we report our results without using organisational membership as a control variable.

To test Hypotheses 1 to 5, we compared the differences in magnitude between trait-effectiveness correlations for teleworkers and trait-effectiveness correlations for non-teleworkers (i.e. differential validity; Linn, 1978). This procedure was carried out by transforming the correlations to Fisher z-values, and then conducting a z-test to

assess the significance level of the difference between correlations. Missing values were dealt with using pairwise deletions on an analysis by analysis basis; degrees of freedom ranged from 147 to 154.[2]

Recall to that self-rated performance and satisfaction measures were slightly different for teleworkers versus non-teleworkers. To ensure comparable distributions (which, if different, could affect the magnitude of the correlation) we conducted Levene's tests to assess whether or not differences in variances resulted from the use of the different items. The Levene's tests indicated that the variances were not significantly different—job performance, $F(1, 147) = 0.052$, $p = 0.82$; job satisfaction, $F(1, 147) = 0.324$, $p = 0.57$. As the hypotheses test the relations among the predictors and criteria, mean-level differences are not relevant for purposes of the tests of the hypotheses. In contrast, different variances would render one test more statistically powerful than the other. Thus, as the criterion variances were not significantly different, comparing correlations across performance and satisfaction items for teleworkers versus non-teleworkers was appropriate.

Tables 2 and 3 contain the correlations used to test Hypotheses 1 to 5. Table 2 provides the descriptive statistics and correlations for the teleworker sample, and Table 3 contains the descriptive and correlations for the non-teleworkers.

Beginning with Hypothesis 1, the personality trait of organisation did not correlate differently with performance in the teleworker ($r = 0.31$) versus non-teleworker sample ($r = 0.35$), nor did organisation correlate differently with job satisfaction ($r = 0.34$ for teleworkers, $r = 0.20$ for non-teleworkers). Thus, Hypothesis 1 was not supported. Tests of Hypothesis 2 were also contrary to expectation. Diligence was strongly related to non-teleworker self-rated performance ($r = 0.45$), but was unrelated to teleworkers' performance ratings ($r = 0.07$). These two relationships are significantly different ($z = -2.53$, $p = 0.01$), but in the direction opposite to that which was hypothesised. Additionally, Diligence did not differentially related to teleworker ($r = 0.05$) versus non-teleworker satisfaction ($r = 0.28$), ($z = -1.46$, $p = 0.14$).

Moving to Hypothesis 3, sociability was related to telworker performance negatively ($r = -0.34$), which was significantly stronger than the correlation for non-teleworkers ($r = -0.03$). These two relationships are significantly different ($z = -2.00$, $p = 0.04$). No significant differences were found for the relationships between Sociability and satisfaction ($r = -0.16$ for non-teleworkers, $r = -0.40$ for teleworkers), although the difference was in the predicted direction and approached significance ($z = -1.59$, $p = 0.11$). Taken together, Hypothesis 3 was partially supported.

Turning to Hypothesis 4, need for autonomy was more strongly associated with self-rated teleworker performance ($r = 0.39$) and job satisfaction ($r = 0.31$) than non-teleworker performance ($r = 0.06$) and job satisfaction ($r = -0.14$) (performance $z = 2.15$, $p = 0.030$; satisfaction $z = 2.77$, $p = 0.01$). Finally, Hypothesis 5 was partially supported. Need for achievement had a stronger relation to self-rated job performance for non-teleworkers ($r = 0.49$) than teleworkers ($r = 0.10$); ($z = -2.58$, $p = 0.010$). This partially supports the hypothesis, wherein need for achievement was strongly and positively related to self-rated performance in non-teleworkers, as predicted, but was not negatively related to perceptions of performance in teleworkers. The hypothesised relations for satisfaction were in the expected direction ($r = -0.00$ for teleworkers, $r = 0.27$ for non-teleworkers), and the difference was marginally significant ($z = -1.69$, $p = 0.09$).

To test Hypotheses 6 to 9, we conducted independent sample t-tests. Hypothesis 6 postulated that teleworkers were more likely to have children living at home than non-teleworkers. This hypothesis was supported, as teleworkers had more children under the age of five ($M = 0.36$, $SD = 0.67$) than non-teleworkers ($M = 0.14$, $SD = 0.48$), $t(154) = -2.37$, $p = 0.02$, and teleworkers also had more children between the ages of 5 and 17 ($M = 0.77$, $SD = 1.16$) than non-teleworkers ($M = 0.42$, $SD = 0.78$), $t(154) = -2.18$, $p = 0.03$.

Hypothesis 7, proposing that teleworkers would have greater organisational tenure than non-teleworkers, was not supported. There were no differences in organisational tenure for teleworkers versus non-teleworkers. Hypothesis 8 posited that teleworkers would have more autonomous jobs than non-teleworkers. t-tests indicated that

Table 2: Descriptive statistics and correlations for measures used in the study (teleworker sample)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	43.487	8.291	—											
2. No. children <5	0.359	0.664	-0.378	—										
3. No. children 5–17	0.769	1.161	0.108	-0.279	—									
4. Organization	3.673	0.848	-0.141	0.073	-0.170	(0.67)								
5. Diligence	4.343	0.631	-0.178	0.113	-0.059	0.573	(0.42)							
6. Sociability	2.910	0.850	-0.353	0.207	0.038	0.098	0.302	(0.76)						
7. N. Achievement	6.320	0.533	-0.141	0.039	0.121	0.129	0.499	0.159	(0.69)					
8. N. Autonomy	5.631	0.807	-0.220	0.062	0.005	0.227	0.188	-0.151	0.131	(0.66)				
9. Job autonomy	5.779	1.523	0.155	0.002	-0.110	-0.093	-0.016	-0.067	-0.096	0.349	—			
10. Job complexity	5.859	1.878	-0.206	0.229	0.044	0.099	0.483	0.271	0.148	0.146	0.219	—		
11. Job performance	5.987	0.868	-0.052	-0.108	0.024	0.309	0.006	-0.342	0.103	0.392	0.020	-0.125	—	
12. Job satisfaction	6.095	1.100	0.073	-0.159	0.026	0.340	0.046	-0.396	-0.004	0.310	0.009	-0.148	0.618	—

Note: SD, standard deviation; Cronbach's alphas on diagonal for multi-item measures.

Table 3: Descriptive statistics and correlations for measures used in the study (non-teleworker sample)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	39.973	10.882	—											
2. No. children <5	0.141	0.476	-0.176	—										
3. No. children 5–17	0.423	0.782	0.045	0.012	—									
4. Organization	3.897	0.655	-0.037	0.026	0.168	(0.61)								
5. Diligence	4.237	0.470	-0.044	-0.079	0.103	0.360	(0.57)							
6. Sociability	3.064	0.678	-0.153	-0.240	0.009	-0.098	-0.059	(0.64)						
7. N. Achievement	6.290	0.520	-0.061	-0.052	0.116	0.252	0.603	0.206	(0.69)					
8. N. Autonomy	5.285	0.874	-0.100	0.027	0.217	-0.151	-0.005	0.031	0.191	(0.71)				
9. Job autonomy	5.197	1.583	-0.205	0.049	0.029	-0.023	-0.037	-0.039	0.022	0.111	—			
10. Job complexity	5.090	2.001	0.158	0.014	-0.041	-0.278	-0.054	-0.162	-0.050	0.109	0.399	—		
11. Job performance	5.893	0.879	0.010	-0.026	0.124	0.351	0.449	-0.027	0.485	0.062	0.100	-0.033	—	
12. Job satisfaction	5.667	1.201	-0.125	0.085	0.029	0.196	0.279	-0.155	0.268	-0.136	0.425	0.080	0.376	—

Note: SD, standard deviation; Cronbach's alphas on diagonal for multi-item measures.

teleworkers ($M = 5.78$, $SD = 1.53$) reported higher job autonomy than non-teleworkers ($M = 5.20$, $SD = 1.58$), $t(151) = -2.31$, $p = 0.02$, supporting Hypothesis 8. Finally, Hypothesis 9 argued that job complexity would be greater for non-teleworkers. The t-test confirmed that non-teleworkers rated the job complexity item lower ($M = 5.09$, $SD = 2.00$) than teleworkers ($M = 5.86$, SD $= 1.88$), $t(154) = -2.48$, $p = 0.01$. Recall that the item for job complexity was reverse keyed meaning that higher ratings indicated less job complexity, thus, Hypothesis 9 was supported.

Discussion

Traits differentiating effective teleworkers from non-teleworkers

The results of this study suggest that certain personality and motivational traits are related to teleworker and non-teleworker effectiveness, but that some traits show differential validity. For example, those who are more sociable and attracted to developing relationships with others (i.e. higher on sociability) tended to report lower ratings on indices of telework performance. These results are in line with suggestions that teleworkers generally experience difficulties because of the isolation of working remotely (Illegems and Verbeke, 2003; Batenburg and Peters, 2005), which are probably compounded for those who are more sociable and affiliative in nature (Harpaz, 2002). In a similar vein, our results also suggest that need for achievement is more related to self-rated performance for non-teleworkers than for teleworkers. As suggested in building the hypothesis, teleworking has the potential to limit promotions and may make it more difficult to provide concrete feedback. This may not fit with the motivations of those with a higher need for achievement.

We found that workers higher on need for autonomy reported higher levels of telework performance. This stands to reason as the scale assesses an individual's desire to work without direct supervision and structure one's own work schedule, and telework by its very nature offers a work environment amenable to such needs. Thus, whereas telework is not as conducive to those with high levels of need for achievement or a need for social interaction, this work arrangement likely resonates with those who need more autonomy, or less supervision, in their work.

Whereas the above results hold promise for differentiating teleworkers based on personality and motivational traits, this study did not find differences in the predictive validity for the trait organization. However, organization was significantly related to teleworker and non-teleworker perceptions of performance and job satisfaction (with the exception of non-teleworkers' job satisfaction, although the correlation approached significance, $p = 0.09$), suggesting that the trait is at least equally important in telework and non-telework arrangements.

Contrary to prediction, diligence was significantly related to non-teleworker self-rated performance and job satisfaction, but it was not significantly related to either of these variables for teleworkers. This reason for this finding is unclear because diligence is characterized mainly by a strong work ethic. One possible explanation might be that diligence is simply not as important when teleworking. Indeed, it might be more important that non-teleworkers are high on diligence because their supervisors have more opportunity to monitor their work behaviour. Conversely, working remotely means that extra work breaks are possible. Indeed, it may be the case that these breaks occur, but that this time is compensated for after regular work hours. Nevertheless, whereas diligence may be associated with non-teleworker effectiveness, it does not seem to relate to teleworker success. Note, however, that this may only be the case for self-reported performance and satisfaction. When it comes to objective performance, teleworkers have been found to be equally or more productive compared to non-teleworkers (Hesse and Grantham, 1991; Harpaz, 2002).

Situational differences in teleworkers versus non-teleworkers

Turning to the situational variables examined in this study, we confirmed that there are indeed some differences between teleworkers and non-teleworkers. First, teleworkers

tend to have more children under the age of five, as well as school-aged children (ages 5–17) living at home than do non-teleworkers. This is might be because home-based teleworking has the *potential* to increase work flexibility for parents, allowing them to better manage the demands of school, health care and illness of their families (Haddon, 1992).

Despite the *possibility* of greater flexibility, teleworkers actually spent *more* hours working than their non-teleworking counterparts. Although not hypothesised, we did find that teleworkers rated themselves as working significantly more hours per week than did non-teleworkers (by about 10%). This finding corroborates the results of other research findings that teleworkers work significantly more hours per week than do non-teleworkers (Schweitzer and Duxbury, 2006), and teleworkers report approximately one additional productive hour per workday (equating to a 12.5% increase in productivity; Roitz *et al.*, 2005). Accordingly, telework may be a double-edged sword: It might allow some room for flexibility in getting one's job done, but it also appears to increase the amount of work one does overall. Thus, the actual extent to which one achieves more work/life balance through telework is an unanswered question (cf. Hotopp, 2002).

A second situational variable that we examined was organisational tenure. We believe that despite not finding a tenure-telework relationship, it still stands to reason that if telework requires higher levels of trust, and those with more tenure are more likely to be trusted, then employees with longer tenure would be more likely to telework. However, we could not rule out the argument that, because telework is becoming a mainstream work practice, certain jobs might be amenable to home-based arrangements despite an employee's tenure. This might result in a decreased need for high levels of trust likely built over longer term relationships. A potentially fruitful avenue for future research might attempt to directly assess the role of trust and telework as well as relations between trust and organisational tenure (e.g. see Peters and den Dulk, 2003).

Finally, we examined whether the job characteristics of job autonomy and job complexity differed among teleworkers and non-teleworkers. As expected, we found that teleworkers reported having greater job autonomy than did non-teleworkers. It could be that more autonomous jobs are better suited for telework, or that teleworkers feel more autonomy because they receive less direct supervision. The cross-sectional design of the present study does not allow us to disentangle the direction of this relation. Nevertheless, compared to office work, telework is associated with employees perceiving greater flexibility in the timing and location of their work (Hill *et al.*, 1998), which probably contributes to perceptions of greater job autonomy.

As with job autonomy, we also found that home-based teleworkers tend to be in less complex jobs. As outlined in developing this hypothesis, jobs that are lower in complexity might be more suitable for telework because they are likely done independently and may not require constant feedback and collaboration. That noted, the differences were based on averages, and certainly do not imply that all home-based telework will tend to be lower in job complexity. Moreover, it might be that complex facets of jobs tend to be done on site, and more rudimentary ones scheduled for telework. Overall, more fine-grained research is needed to address these questions.

Strengths and limitations

One underlying assumption of this research was that telework and non-telework arrangements would exhibit differences *across jobs*. That is, we predicted that certain traits would predict effectiveness, and certain job characteristics would be different, depending on whether one teleworks or does not regardless of the specific job. This approach, by definition, ignores many between job differences. There will be instances where a telework job is high on complexity and low on autonomy (e.g. writing very specific programming code), and where sociability may be positively related to performance when teleworking (e.g. some home-based sales positions). Nevertheless, we

argue that there is a different psychological experience between working from home and working from the office. Knowing a colleague is a phone call away compared to knowing he or she is working just over the cubical wall is psychologically different, and our reasoning was that, on average, the expected relations would tend toward a certain direction. However, specific jobs may deviate from the 'average' findings observed in this study. This is where job analysis becomes an invaluable tool for determining the characteristics of the job and work environment, and the competencies needed to perform effectively in it.

One strength of the present research is that the observed trait-criterion correlations were of considerable magnitude. Many correlations with effectiveness measures were in the neighbourhood of 0.25 to 0.40, which are considerably higher than comparable meta-analytic corrected correlations considered substantial by many (e.g. Barrick and Mount, 1991). Moreover, utility analyses have demonstrated that even small correlations, or increments in variance accounted for, can have a huge impact on test utility (e.g. Hunter and Hunter, 1984; Cascio, 1991; Mabon, 1998). Despite these arguments, our study clearly does not account for all the variance in telework effectiveness, and future research stands to benefit from considering a wider range of traits and abilities.

Another strength of the study is that it is one of the first to compare the predictive validity of personality and motivational traits in teleworkers and non-teleworkers. Very few studies, if any, have aimed to uncover the traits that might be most relevant for *telework* effectiveness. We see building on this exploratory study as a priority for future research, as even in the same job, different attributes may be required for successfully performance under telework and non-telework conditions.

We wish to note that the generalisability of the study is dependent on the sampling techniques employed (i.e. largely snowball sampling). However, it should be noted that our sample comprised many different jobs, which increases the generalisability of our study relative to those that use a single job or class of jobs (e.g. Golden, 2006). Moreover, snowball sampling is a commonly used method of data collection in this field (e.g. Konradt *et al.*, 2000).

The design of this study was cross-sectional; thus, the directionality of cause and effect relations can not be established (Gravetter & Wallnau, 2005). This is a limitation shared by virtually all comparable studies in this area of research (e.g. Weisenfeld *et al.*, 2001). Furthermore, despite the fact that causality cannot be determined, it is unlikely that self-rated performance or job satisfaction could *cause* personality traits. Thus, it can probably be assumed that the causal arrow points away from the traits and toward work effectiveness.

Another limitation of this study was that some of our scale reliabilities were low. However, if one compares the reliabilities observed here to the well-known NEO PI-R facets (Costa and McCrae, 1992), the differences are trivial. Specifically, in Costa and McCrae's (1992) manual, Cronbach's alpha for Tender-Mindedness, a facet of Agreeableness, is 0.56. Similarly, Cronbach's alpha for the Actions scale, a facet of openness, is 0.58. Thus, in comparison to the NEO-PI R, our scale reliabilities are not unusually low. We also note that, despite the low reliabilities, we still found several significant relations that were in the predicted direction. Because unreliability attenuates correlations, our results might be viewed as an *underestimate* of the true trait-criterion relations.

A final limitation mentioned here is our exclusive use of self-report measures. First, this can inflate correlations because the same rating scale was used at the same time of measurement, otherwise known as common method bias (Conway, 2004). Because of the limitations imposed by participating organisations, we were not able to collect data on two separate occasions, nor were we able to access supervisor, peer or objective methods to assess performance. As a result, some of the correlations we have reported may be inflated by common method bias (but see Spector, 2006). However, we could not put together any theoretical reason as to why the general *pattern* observed in our data would change in the absence of method bias (even after consulting reviews of that literature; e.g. Podsakoff *et al.*, 2003). Thus, we expect the conclusions of the study

would also be unlikely to change had we controlled for method bias using multi-method data collection.

Practical implications

The findings regarding the traits that related to telework effectiveness have at least two implications for practitioners. First, practitioners can use these results as a starting point for establishing selection measures that predict teleworker success. Our results show that items/constructs relating to an individual's need for social relationships (i.e. the trait of sociability) may be negatively related to telework effectiveness in certain jobs (see also Weisenfeld *et al.*, 2001). Additionally, comparing individuals on need for autonomy may also differentiate among potential teleworking personnel. Namely, those with greater need for autonomy will more likely perform effectively in a telework arrangement. In addition to personality and motivational traits, the job characteristics of job autonomy and job complexity should be considered when determining whether an individual is in a position that is amenable to telework effectiveness.

The second implication is for training personnel to telework effectively, and for the actual implementation of telworking arrangements. The behaviours that are related to certain facets of personality and motivational traits can be used in the development of telework training programmes. For example, telework initiatives can work to institute more scheduled meetings and co-worker interactions for those with higher levels of sociability (Gray *et al.*, 1993).

Future research

Our results suggest that future research on the role of personality in predicting telework effectiveness will likely prove fruitful. Research has shown that personality is a robust predictor of job performance (cf. Hogan, 2005; Rothstein and Goffin, 2006), but the present research adds to this knowledge base by showing that different personality traits are relevant for the prediction of teleworker, as opposed to non-teleworker, effectiveness. Building on our exploratory study by measuring a broader array of traits and should further our understanding of how between personality predicts telework and non-telework effectiveness differentially. For example, future research could consider measuring the entire Big Five personality factors, and the facets they subsume, to assess whether or not there are other traits that distinguish effective teleworkers from non-teleworkers.

One way to build on the findings presented here is to investigate *why* personality and motivational traits correlated with telework effectiveness. For example, our review of the literature suggested that successful teleworkers will be able to effectively separate work from non-work life, work without close supervision, and overcome barriers of isolation. Measuring these variables, and using them as mediators of the trait-outcome relations would determine whether these differentiators: (1) are predicted by personality and/or motivational traits, and (2) predict telework effectiveness. Thus, a model could be derived to determine if the proposed variables mediate the personality—effectiveness relationship.

Conclusion

Our results suggest that organizations will need to be cognizant of *who* they select for telework arrangements. The personality characteristics of Sociability as well as the motivational traits of need for autonomy and need for achievement were related to effectiveness differentially for teleworkers and non-teleworkers in the present study. Our findings demonstrate the importance of carefully considering working conditions when aligning traits with job outcomes (Hough, 1992; Hough and Schneider, 1996). Finally, certain situational factors and job characteristics, such as number of children, job autonomy and job complexity, might warrant consideration when implementing

telework programmes or increasing telework adoption. Although exploratory in nature, this study is one of the first attempts to assess dispositional factors associated with perceptions of teleworker performance and job satisfaction. In doing so, it has laid some foundation for future research that could further investigate the relation between traits and telework success.

Notes

1. We did not include need for affiliation because it is highly related to sociability, and therefore, need for affiliation would be unlikely to provide additional information.
2. Note that we could not use moderated multiple regression to test for interactions. Recall that we had different criterion items for the teleworkers and non-teleworkers in terms of effectiveness. We needed to have different criterion items to ensure teleworkers only rated their effectiveness *while* teleworking, whereas the non-telework group did not have the word 'telework' in their effectiveness items (see Table 1). Accordingly, because the outcome criteria were different for teleworkers and non-teleworkers in terms of the actual item being rated (i.e. the dependent variable), we were unable to use moderated multiple regression as that procedure requires the same dependent variable for testing the interaction (Tabachnick and Fidell, 2007).

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