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Explaining the Intended Continuance Level of Telecommuting

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Explaining the intended continuance level of telecommuting

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Abstract: In this study, we demonstrate and enhance the applicability of the Theory of Planned Behavior (TPB) to the explanation of the intended continuance level of telecommuting. We discuss the distinctiveness of the telecommuting context and its implications for the significance and relative importance of the TPB constructs. We also decompose the attitudinal, normative and behavioral control belief structures to identify factors that are specific to telecommuting. The results of a survey of 101 current telecommuters in the USA provide strong support for the proposed theoretical developments. Overall, the model explains 49.2% of the variance in telecommuters' intended level of telecommuting continuance. Despite a negative moderating effect of habit, attitude maintains a significant effect on intention. Subjective norms also continue to exert a moderate effect on intention. The effect of behavioral control is the weakest but is nevertheless significant. Significant attitudinal variables include economic benefits, productivity, quality of life and career development. The influences of peers, family and superiors are also found to be significant subjective norms. As for behavioral control, the significant factors include self-efficacy and workspace.

Keywords: Telecommuting; Continuance Intention; Theory of Planned Behavior; Quasi-Voluntary Behavior

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1. Introduction

Studies of information technology (IT) usage typically assume that IT users are free to behave as they choose, i.e. that they behave voluntarily. Furthermore, these studies tend to focus on initial adoption of the technology (cf. Moore and Benbasat, 1991; Rogers, 1995), without explaining whether the usage will be continued and if so at what level. While the initial adoption decision is clearly important, adoption does not guarantee continued use. Furthermore, not all IT usage behavior is voluntary in nature. Some may be mandatory (where users have no choice at all) and others may be quasi-voluntary (where users have a choice, but are nevertheless subject to significant constraints and pressures that may influence their decision). Notwithstanding the mandatory, voluntary or quasi-voluntary nature of the IT usage, individual and organizational impacts of technology depend on the level of continued usage.

One particular IT application that is seldom entirely voluntary in terms of its adoption and continued usage is telecommuting. Although it is the individual employee who must decide to telecommute, telecommuting directly affects significant others, i.e., superiors, family members and co-workers. The pressures on the potential telecommuter exerted by these significant others, as well as cultural norms and work conditions, constrain the voluntariness of telecommuting. For current telecommuters, such pressures are not anticipated but rather experienced and may therefore have important effects on continuance levels. After performing a thorough review of the telecommuting literature, we were surprised by the scarcity of both theoretically underpinned research into telecommuting and analyses of the telecommuting phenomenon beyond the initial adoption decision. This scarcity is in fact symptomatic of a deeper crisis in IS research, characterized by Benbasat and Zmud (2003, p.183) as “under-investigating phenomena intimately associated with IT-based systems and over-investigating phenomena distantly associated with IT-based systems”. Similar concerns have been expressed by Orlikowski and Iacono (2001, p.121) who argue that the IS field “has not deeply engaged its core subject matter – the information technology artifact”. Indeed, the distinctiveness of specific IT artifacts must be considered in research of this kind, given that these technologies exist in varying “social, historical and institutional contexts, [are] understood in particular ways and [are] used for certain activities. ... there is no single, one-size fits all conceptualization of technology that will work for all studies” (ibid., p.131). Drawing on this premise, in this paper we study the specific context of telecommuting continuance, arguing its distinctiveness from the contexts of previous IS continuance research such as usage of personal computers or online shopping. We

develop, operationalize and empirically test a model for explaining the intentions of current telecommuters with respect to the level of continuance of their future telecommuting behavior. Intention has been shown to be a strong predictor of technology usage behavior (Venkatesh, Morris and Ackerman, 2000). Our model is based on the theory of planned behavior (TPB) proposed by Ajzen (1991) and its subsequent development into the decomposed TPB (Taylor and Todd, 1995a). We identify factors that are of particular salience to telecommuting and contrast our empirical results with those of previous studies on IS continuance and post-adoption behavior

The layout of the paper is as follows. We first review the literature regarding telecommuting before examining the applicability of the TPB to continuance behavior in general and telecommuting in particular. We then highlight the distinctiveness of telecommuting before introducing the research model. Next, we describe the empirical study used to test the model and analyze its results. In the conclusion, we discuss the implications of this study for theory and practice, and propose future research directions.

2. Telecommuting

Interest in telecommuting was kindled in the early 1980s, when organizations were pressured to find ways to improve worker productivity and reduce expensive office space. More recently, organizations have found themselves under less predictable pressures, such as those created by terrorist acts and natural disasters, both of which mitigate against centralised operations (Gill, 2005). Previous studies on telecommuting typically attempt only to identify the *potential* effects of adopting telecommuting as a mode of work (e.g. DeSanctis, 1984; Iscan and Naktiyok, 2005). Such studies either focus on the beliefs, attitudes and intentions of potential telecommuters, or involve interviews with managers concerning the plausible yet hypothetical benefits which might arise through telecommuting. However, these studies not only fail to elicit the beliefs and attitudes of current telecommuters and their managers but also fail to explain how such beliefs and attitudes might affect telecommuting intentions and behavior. Important exceptions include: Bélanger, Collins and Cheney (2001), Dixon and Webster (1998), Harrington and Ruppel (1999), Igbaria and Guimaraes (1999), Pearlson and Saunders (2001), Peters, Tijdens and Wetzels (2004), Raghuram and Wiesenfeld (2004) and Reinsch (1999). Furthermore, much of the literature is anecdotal or speculative, lacking any kind of theoretical underpinning (Bélanger and Collins, 1998; Igbaria and Guimaraes, 1999).

The potential benefits of telecommuting are manifold and make it appealing both to employers and employees (Nilles, 1997). Organizations can expect to see reduced overhead costs in maintaining a central work facility, improved work productivity, greater staffing flexibility, increased employee loyalty, lower absenteeism and better employee retention (Bélanger and Collins, 1998; Humble, Jacobs and Van Sell, (1995), Lobel, Googins and Bankert (1999) and Raghuram and Weisenfeld (2004). Apgar (1998) reports that AT&T saved US\$550M in cash flow from 1991-1998 by eliminating unused office space. In a similar initiative, IBM is reported as saving \$100m per year in a single North American unit, some 87% of telecommuters on the project believing that their personal productivity and effectiveness increased significantly. Meanwhile several organizations have identified telecommuting as a contributing factor in increasing competitiveness, e.g. Borg-Warner (Miller, 1986) and Texaco (DeSanctis et al., 1986). In addition to productivity improvements, American Express found that telecommuting enabled it to retain experienced employees who find the flexibility of working from home particularly attractive (Apgar, 1998). Telecommuters in turn can expect a higher quality of life (Yap and Tng, 1990), reduced transportation costs and time (Baruch and Nicholson, 1997), and

an escape from the distractions and stresses of the office (Igarria and Guimaraes, 1999). Allied to this saving of time is the autonomy and schedule flexibility that telecommuting promotes, permitting telecommuters to work at times most convenient to them (Venkatesh and Vitalari, 1992).

Notwithstanding the advantages that can accrue to organizations that promote telecommuting, the actual take-up of this mode of work has been slower than initially expected, with no more than 10% of the workforce in most economies engaging in telecommuting on a regular basis (Schweitzer and Duxbury, 2006). The lack of support from or interest of managers is often cited as a reason for this slow adoption rate (Duxbury and Higgins, 2002), but other potential drawbacks attributable to telecommuting have been identified, many focusing on the relationship between employers and employees. It is perceived, for instance, that there is a strong need for face-to-face communication in organizations in order to share the corporate culture, attitudes and concerns, and foster loyalty (Harrington and Ruppel, 1999). Bélanger and Collins (1998) suggest that compatibility between telecommuting and the organization, the individual, the nature of work and technology is important to the success of this work arrangement. Some managers, particularly those in hierarchical organizational structures (Harrington and Ruppel, 1999), may have a hard time contacting, controlling, evaluating, supervising and trusting people whom they cannot see (Kavan and Saunders, 1998; Pearlson and Saunders, 2001). Employees in turn report a sense of social and professional isolation and reduced visibility when left out of office-based communication patterns (Venkatesh and Speier, 2000), which may even result in psychosocial complications such as a tendency towards autism (Baruch, 2001). This can subsequently result in career development problems (Bélanger and Collins, 1998; Duxbury, Higgins and Neufeld, 1998). Furthermore, there is a genuine risk that employees with little bargaining power will be exploited (Daniels, Lamond and Standen, 2001), as it has often been suggested that telecommuters end up working longer hours (Duxbury, Higgins and Neufeld, 1998; Fenner and Renn, 2004).

The advantages and disadvantages of telecommuting are relevant not only to telecommuters themselves, but also to organizations that are considering establishing telecommuting programs, both in terms of possible legal complications (cf. Baruch and Smith, 2002; Swink, 2001) and in terms of identifying which people may be most likely to work effectively in such programs. Merrill Lynch, for example, are reported as having simulated the telecommuting environment by deliberately isolating potential telecommuters from colleagues and supervisors (Roberts, 1998). Assuming that telecommuting is permitted or encouraged, the level of telecommuting is usually decided by the employees themselves. However, the decision is not an entirely free one as there are a number of formal and informal pressures that may influence whether or not an employee decides to adopt the telecommuting work arrangement, and subsequently, the extent to which the current telecommuter adjusts the level of telecommuting.

3. Applicability of the TPB to Continuance Behavior

Earlier studies on IS continuance viewed continuance behavior as post-adoption usage (e.g., Davis, Bagozzi and Warshaw, 1989; Karahanna, Straub and Chervany, 1999) and relied on intention-based theories such as TAM (Davis, Bagozzi and Warshaw, 1989) and the TPB (Ajzen, 1991). More recently, Bhattacharjee (2001) argued that the post-adoption usage models implicitly assume that continuance covaries with acceptance and are therefore unable to explain discontinuance after the initial acceptance, calling it “the

acceptance-discontinuance anomaly". Bhattacharjee proposed the usage of satisfaction as the main determinant of continuance intention in addition to perceived usefulness and assessed satisfaction based on the expectation disconfirmation theory. However, Bhattacharjee's (2001) model does not represent a major departure from intention-based models, since it is simply a reduced TAM or TPB.

Like Doll and Torkzadeh (1988), Bhattacharjee views satisfaction as an affect. In the marketing literature, however, satisfaction is viewed as a multidimensional construct including both affective and cognitive elements. Satisfaction is the "cognitive state" of an individual or his/her "emotional response" to the experience associated with a product/service (Westbrook and Reilly, 1983). The distinction between cognition and affect has attracted much attention in research on attitude structure (Breckler and Wiggins, 1989; Insko and Schopler, 1967). The affective component of attitude includes feelings, emotions, or drives associated with an attitude object, and the cognitive component includes judgments, beliefs, or thoughts associated with the attitude object (Breckler, 1984; Zanna and Rempel, 1988). Although several IS studies operationalized the attitude construct primarily as affect (e.g., like/dislike), the original definition of the attitude construct in the TPB captures both cognitive and affective aspects (Ajzen, 1991). Regardless of whether satisfaction is just affect or is multidimensional in character, it remains an attitudinal variable and is therefore already accounted for in the TPB.

Where perceived usefulness is concerned, Taylor and Todd (1995a) have already modeled it as an antecedent of attitude in the decomposed TPB. Regarding the applicability of subjective norms and behavioral control, it is important to stress that social influences and situational variables do not simply disappear after adoption. Ajzen and Madden (1986) applied the TPB to the explanation of the intended level of attendance of class lectures and found that each of the three predictor-variables of the TPB contributed to the prediction of the intended level of attendance.

Morris and Venkatesh (2000) demonstrate the predictive validity of the TPB constructs when predicting sustained use. Although all TPB constructs remain applicable to continuance behavior, the significance and relative importance of their effects may change with exposure and usage experience. Hartwick and Barki (1994) examined the determinants of IS usage both prior to development and following system implementation. They found that the relative importance of subjective norms and attitude changed depending on the system development stage, with subjective norms exerting a greater influence on usage intention than attitude prior to systems development, but the reverse being true following systems implementation. Changes in the relative importance and significance of some of the constructs are not the only differences between the TPB's explanation of continuance behavior and its explanation of adoption behavior. Several other studies (e.g. Bhattacharjee and Premkumar, 2004; Taylor and Todd, 1995b, Venkatesh and Davis, 2000; Venkatesh, Morris and Ackerman, 2000) indicate the importance of distinguishing between more or less experienced users and their respective beliefs over time.

Continuance behavior is also influenced by habitual factors in a way not readily encompassed by concepts in the TPB (Conner and McMillan, 1999; Eagly and Chaiken, 1993). A number of studies have pursued the importance of habit in this regard, notably Godin, Valois and Lepage (1993), who found that habit was the most important predictor of continuance behavior over and above the TPB variables, and Limayem and his colleagues (Limayem, Hirt and Chin, 2001; Limayem, Hirt and Cheung, 2003), who provided evidence for the moderating effect of habit on the intention-use relationship in an IS context. Verplanken and Aarts (1999) present a comprehensive review of the conceptualization and role of habit in intention formation and behavior. They identify two

main bodies of research: studies that explicitly included habit or past behavior in models of attitude-behavior relationships, and other studies that considered habitual behavior as an interesting form of automaticity. They argue that habitual behavior is not necessarily unintentional. Ouellette and Wood (1998) also support the idea that habit does not preclude intention formation. In fact, intentions sometimes conflict with habit. "A shift in one's perceived consequences of behavior or in one's evaluation of those consequences can motivate people to form new intentions" (ibid., p. 56). In this regard, several studies have demonstrated that habit does not just moderate the relationship between intention and behavior, but also moderates the relationship between attitude and intention (e.g., Mittal, 1988; Verplanken et al., 1994).

4. Distinctiveness of Telecommuting

Given Orlikowski and Iacono's (2001) premise that we should not treat the study of all IT artifacts in a monolithic fashion, instead theorizing explicitly and separately about specific technologies, so we draw attention to the distinctive characteristics of the usage of IT to telecommute. Distinctiveness here is considered in terms of the significance and relative importance of the determinants of the intended continuance level of telecommuting. It is also considered in terms of attitudinal, subjective norm and behavioral control variables that are specific to telecommuting. Most previous studies on adoption and usage of IT (e.g., adoption of personal computers or specific computer applications) involved contexts in which the user's behavior mainly affected the user him or herself and had indirect or minimal effects on others. Telecommuting, however, has direct consequences for significant others, e.g., family, peers and superiors who may have conflicting interests (cf. Cooper, 2005).

The effect of telecommuting on family life is well documented in the literature. Telecommuting can increase the amount of time that a telecommuter spends with family members (Humble, Jacobs and Van Sell, 1995). This is particularly true for people living long distances away from the work site. According to Whitehouse, Dimond and Lefferty, 2002, telecommuting increases the flexibility for looking after family-related matters. However, if not well managed, telecommuting may create work-family conflicts (Cooper, 2005). Keeping a balance between work and family is an important challenge for the telecommuter (Duxbury, Higgins and Neufeld, 1998). Duxbury, Higgins and Irving (1987) comment that telecommuters often work longer hours - another source of conflict if workers cannot separate work and family roles. These potential effects may result in pressure from family members to adjust the telecommuting behavior. A number of scholars (e.g. Bélanger, 1999; Bélanger and Collins, 1998; Dixon and Webster, 1998) discuss the role of family pressure, which may be either in favor of or against telecommuting. In an interpretive case study, Tietze (2002) reports that telecommuting continuance depends on the ability of the telecommuter to manage both family and work at home. In one case, the employee decided to decline a promotion, as this would have required him to stop telecommuting and go back to the office – such a change was unacceptable to the family.

The effects of telecommuting on the telecommuter's managers and peers are also widely reported in the literature. Telecommuters expect their relationship with their peers to deteriorate over time (Yap and Tng, 1990). Consistently, Reinsch (1997) suggests that telecommuting may weaken the relationship between the telecommuter and his manager. Indeed, Guimaraes and Dallow (1999) argue persuasively that the telecommuter and his manager need to engage in a relationship of mutual trust and support if telecommuting is

to work effectively (cf. also Harrington and Ruppel, 1999; Higa et al., 2000). Teo, Lim and Wai (1998) reflect on the importance of peer support for telecommuters. The effects of telecommuting on managers and peers are expected to translate into important pressures from affected coworkers on the telecommuter.

As with family pressure, peer and superior pressure may either favor or counter continued telecommuting behavior. For example, from a management perspective, a large telecommuting program can lead to significant reductions in office expenses, significant increases in personal productivity, and retention of valued employees even if they physically relocate elsewhere (Apgar, 1998; Bélanger and Collins, 1998; Humble, Jacobs and Van Sell, 1995; Igbaria and Guimaraes, 1999). On the other hand, a newly appointed manager, who prefers to control his subordinates directly with significant amounts of face-to-face communication, may find that his ability to do so is severely curtailed if those subordinates are currently in a telecommuting program (Kavan and Saunders, 1998; Pearson and Saunders, 2001). Furthermore, there is a genuine risk that employees with little bargaining power will be exploited (Daniels, Lamond and Standen, 2001; Kraut, 1989), as it has often been suggested that telecommuters end up working longer hours (Duxbury, Higgins and Neufeld, 1998). The pressure from peers is usually less obvious than from managers, but may be demonstrated when there are a relatively small number of telecommuters in a program who are excluded from office politics by reason of their physical absence (Venkatesh and Speier, 2000) – or in contrast, when most members of the peer group telecommute and actively approve of this mode of work (cf. Teo, Lim and Wai, 1998).

The distinctive characteristics of telecommuting discussed above qualify it as a quasi-voluntary behavior. The voluntariness or otherwise of user behavior has received little explicit attention in the IS literature. Most prior IT adoption studies appear to be premised on the assumption that users are free to decide if, when, how and how frequently they use the technology. Thus, their behavior is assumed to be voluntary. Behavior that is subject to significant constraints and external pressures or influences, yet is not mandatory, can thus be considered to be quasi-voluntary. Voluntariness has been the subject of very few research papers, most notably Karahanna, Straub and Chervany (1999) and Venkatesh and Davis (2000). Karahanna, Straub and Chervany (1999) examined the voluntariness of adoption and continuing usage of Microsoft's Windows technology in an organizational context. They operationalized voluntariness by considering the influence of an employee's boss, as well as an explicit measure of whether or not it was compulsory to adopt Windows. They also, separately, assessed the subjective norms that might influence the employee. They found the effect of the perceived voluntariness to be insignificant for adoption and significant for continuance. The effect of subjective norms, however, was found to be significant for adoption and insignificant for continuance. Meanwhile Venkatesh and Davis (2000) compared voluntary usage of systems in two organizations with mandatory usage of systems in two other organizations. They modeled voluntariness as moderating the effect of subjective norms on the intention to use, defining voluntariness as "the extent to which potential adopters perceive the adoption decision to be non-mandatory" (*ibid.*, p. 188). Voluntariness was found to influence significantly user acceptance.

The distinctiveness of telecommuting is not limited to its quasi-voluntariness. It is also reflected in the specificity of the determinants of attitude, subjective norm and behavioral control. Where the telecommuter's attitudinal formation is concerned, a number of perceived consequences of telecommuting are important. Researchers have found that telecommuters value telecommuting as a way of improving both their quality of life and their productivity (Miller, 1986; Yap and Tng, 1990). Economic benefits may

also be accrued through reduced transportation costs and time (Baruch and Nicholson, 1997), and an escape from the distractions and stresses of the office (Igbaria and Guimaraes, 1999; Nilles, 1997). Allied to this saving of time is the autonomy and schedule flexibility that telecommuting promotes, permitting telecommuters to work at times most convenient to them (Venkatesh and Vitalari, 1992). However, negative consequences also exist, for example when telecommuters experience social and professional isolation and reduced visibility when left out of office-based communication patterns (Venkatesh and Speier, 2000). This can subsequently result in career development problems (Bélanger and Collins, 1998; Duxbury, Higgins and Irving, 1987). In this context, performance evaluation will be a concern, specifically issues such as distributive, procedural and interactional justice (Kurland and Egan, 1999), and the extent to which communication between telecommuters and their managers is formalized and institutionalized (Olson, 1982; Zuboff, 1982).

A number of environmental factors are also of distinctive importance to the telecommuter. These include issues such as the technology available to support their work at home (McCune, 1998), who pays for it (Venkatesh and Brown, 2001), the more general support for work that is usually available from clerical and administrative support staff (Apgar, 1998; Cooper, 2005), as well as the availability of a suitable workspace in the home environment or in a nearby satellite work centre (Fritz, Narasimhan and Rhee, 1998). Within this context, employees need to be able to work at least as effectively as they would in the traditional workplace. Moreover, compatibility between the practice of telecommuting, the values of the organization, the individual telecommuter, the supporting environment, the nature of work and the available technology are critical to the success of telecommuting (Bélanger and Collins, 1998).

5. Research Model

The distinctive characteristics of telecommuting discussed earlier lead us to believe that subjective norms and behavioral control will continue to play a significant role in intention formation after adoption, contrary to what is modeled or reported in previous post-adoption usage and continuance research (e.g., Bhattacharjee, 2001; Hartwick and Barki, 1994; Karahanna, Straub and Chervany, 1999). A number of constraints (e.g., access to appropriate technologies and availability of remote workspace) and the influence of significant others affected by telecommuting, limit the voluntariness of this behavior even when the organization allows it. The quasi-voluntariness of the telecommuting behavior is, however, captured in the effects of the behavioral control construct (for IT and other constraints) and the subjective norms construct for the influences of significant others. This is in line with Moore and Benbasat's (1996) argument that the extent to which IT usage is voluntary depends on both the perceived formal requirements for its use, and less formal social influences.

The performance of the behavior allows the telecommuter to experience the constraints (availability and adequacy of resources) first hand. Also, significant others will have a chance to evaluate the consequences of the telecommuter's behavior on them and then exercise greater or lesser pressure to adjust the continuance level of the behavior. For example, the telecommuter's family may realize that the quality of family life has improved as a consequence of telecommuting and would then encourage the telecommuter to continue the behavior or even increase its frequency. Conversely, the telecommuter may not be able to manage properly the work-family interference and in such a case the family may exert pressure to reduce the level of the behavior or even discontinue it. Similar

scenarios can also be envisioned for various pressures from other entities affected by the behavior, e.g., supervisors and peers. While in other contexts the effect of subjective norms diminishes after adoption (Hartwick and Barki, 1994; Karahanna, Straub and Chervany, 1999), for telecommuting their effect remains significant and may even intensify. A similar argument can also be made for behavioral control. It is therefore insufficient to rely solely on perceived usefulness and attitude (or a specific attitudinal variable, i.e., satisfaction) to explain the intended continuance level for telecommuting, such as in the model proposed by Bhattacharjee (2001). The other constructs of the TPB, i.e., subjective norms and behavioral control should also be included. Furthermore, with repeated performance telecommuting becomes more habitual. In such a case, habit emerges as an important predictor of the continuance behavior over and above the TPB variables (Godin, Valois and Lepage, 1993). Grounded in the TPB, our research model (see Figure 1) emphasizes the important effects of subjective norms and behavioral control in addition to that of attitude for the telecommuting context and accounts for the moderating role of habit in explaining the intended level of telecommuting continuance. It also decomposes the TPB constructs to identify determinants of attitude, subjective norms and behavioral control that are specific to telecommuting.

While we do not state hypotheses formally in this section, we nevertheless indicate hypothesised relationships between variables in this section – and in the corresponding Figure 1 – using the notation H1 – H4 for the independent variable to dependent variable hypotheses, and, e.g. H1a, H3c, etc. for the antecedents of the independent variables.

Insert Figure 1 about here

5.1. Attitude and its determinants.

Ajzen (1991, p. 188) defines attitude as “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question”. Many previous studies (e.g. McCune, 1998; Teo, Lim and Wai, 1998; Yap and Tng, 1990) have found that one’s attitude towards telecommuting positively influenced the intention to telecommute. There is also evidence that attitude continues to have a significant effect in the context of continuance intention. Bhattacharjee (2001) and Bhattacharjee and Premkumar (2004), for example, found that the attitudinal variable of satisfaction played an important role in the intention formation of IS continuance. The effect of attitude is in fact expected to be stronger when the attitude is based on direct experience (Ajzen and Fishbein, 1980; Bhattacharjee and Premkumar, 2004; Regan and Fazio, 1977), due to improvements in attitudinal qualities, e.g., clarity and certainty. This is supported by the results of Karahanna, Straub and Chervany (1999) who reported a stronger attitudinal effect for continuance (significant path coefficient of .4) than for adoption (insignificant path coefficient of .28). With repeated performance of the behavior, however, the strength of the effect of attitude on continuance may diminish as the behavior becomes increasingly habitual. Nevertheless, we expect the net effect of the telecommuter’s attitude towards telecommuting on his/her intended level of telecommuting continuance to be significant (H1).

One of the main determinants of attitude is perceived usefulness, as illustrated in the decomposed TPB (Taylor and Todd, 1995a) and TAM (Davis, Bagozzi and Warshaw, 1989). Moore and Benbasat (1991) and Rogers (1995) call it relative advantage. Triandis (1980) proposed a similar construct, called perceived consequences. We prefer to use Triandis’ construct label, as it is more neutral: consequences can be either positive or negative. Although, attitude has other determinants, e.g., ease of use, we have decided to focus on perceived consequences, as these would be of particular interest to practitioners. To identify specific telecommuting consequences, we reviewed the literature and

conducted a series of belief elicitation interviews with twenty-eight current North American telecommuters. In these interviews we also elicited specific factors for the subjective norms and behavioral control constructs. During the belief elicitation interviews, the interviewees were asked to identify specific consequences of their current telecommuting that they would consider in evaluating the overall consequences of telecommuting. Four specific perceived consequences were identified, viz.: economic benefits (H1a), productivity (H1b), quality of life (H1c) and career development (H1d). These four factors are consistent with the literature. Economic benefits are widely regarded as an important reason to telecommute (Caudron, 1992; Humble, Jacobs and Van Sell, 1995. Bélanger and Collins (1998) note that “time and monetary cost savings stem from reduced or eliminated commutes to work”, while most telecommuters retain the same reward system that applies to regular workers. It is also commonly perceived that distributed work arrangements can lead both to a higher level of creativity and more productivity as concentration is less interrupted and the time that would otherwise be spent commuting can be spent working (Bélanger and Collins, 1998; Fritz, Narasimhan and Rhee, 1998; Humble, Jacobs and Van Sell, 1995). Where career development is concerned, telecommuters may harbor concerns that telecommuting will hinder their career development, the reasoning being that staff who maintain face-to-face contact with superiors in the office are more likely to be noticed and therefore promoted than those who are not - the old adage ‘out of sight, out of mind’ is seen to apply (Davenport and Pearlson, 1998; DeSanctis, 1983; Khalifa and Etezadi, 1997; Westfall, 1997). In this context, performance evaluation will be a concern, specifically issues such as distributive, procedural and interactional justice (Kurland and Egan, 1999), and the extent to which communication between telecommuters and their managers is formalized and institutionalized (Olson, 1982; Zuboff, 1982). Finally, quality of life issues are seen as important (Apgar, 1998; Baruch and Nicholson, 1997). Although telecommuting has the potential to increase work-family conflicts, the time saved can be spent effectively on other, more useful or pleasurable activities. Indeed, the presence of a computer in the home may enable other social and/or hedonistic activities that indirectly contribute to the telecommuter's quality of life (cf. Venkatesh and Brown, 2001).

5.2. Subjective norms

This construct refers to perceived social pressure regarding the performance of a behavior. Subjective norms are believed to affect behavioral intentions (H3) (Fishbein and Ajzen, 1975; Venkatesh and Vitalari, 1992). We view this construct as those norms, roles, and values at the societal and organizational levels that influence an individual's intention to telecommute at a certain level. In this context, the norms and values that are conveyed through interaction with colleagues, superiors (e.g., managers) and family members are all examples of social factors. These interactions can be in the form of comments, suggestions or directives. Bélanger and Collins (1998), Ruppel and Howard (1998), Teo, Lim and Wai (1998) and Yap and Tng (1990) all emphasize the importance of social factors. Apgar (1998, p. 125) notes the importance of having “a multifunctional team of senior managers promoting and supporting a virtual-office initiative right from the start”. While the effect of subjective norms on adoption intention is well established, their effect on continuance intention is not. Karahanna, Straub and Chervany (1999) found that subjective norms were significant (and even more important than attitude) for explaining adoption intention but not significant for explaining continuance intention. For telecommuting, however, subjective norms should continue to have a significant effect even in the post adoption stage. We believe that such factors are important for deciding the level at which to continue the telecommuting behavior. Given the arguments presented earlier in describing the characteristics of quasi-voluntary behavior, we expect social pressures should be more salient for telecommuters who are not anticipating but rather are already experiencing

these pressures. We therefore hypothesize that there will be a positive relationship between subjective norms and the telecommuter's intended level of future telecommuting.

Several studies have suggested the decomposition of normative belief structures. Taylor and Todd (1995a), for example, show the importance of decomposing subjective norms into relevant referent groups, citing possible divergence of opinion among these groups. In the belief elicitation interviews, described earlier, we also asked the interviewees to identify specific social factors that would contribute the most to the overall social pressure influencing their intentions regarding their future level of telecommuting. Three specific factors were identified as being particularly important for the subjective norms construct, viz.: superior influence (H3a), family influence (H3b) and peer influence (H3c). These factors are also supported by the literature (see section on telecommuting distinctiveness).

5.3. Perceived behavioral control

According to the TPB [2], the construct of perceived behavioral control includes both environmental factors, which are similar to Triandis' (1980) notion of facilitating conditions and Mathieson, Peacock and Chin's (2001) notion of perceived resources, as well as the internal factor of individual self-efficacy (Bandura, 1977). In the context of telecommuting, self-efficacy refers to the telecommuter's confidence in his/her ability to function independently and effectively from a remote location. When individuals perceive that the facilitating conditions are not favorable due to lack of opportunity, resources or ability, then their intended level of continued telecommuting will decrease even if the subjective norms, attitude and perceived consequences are all auspicious. Current telecommuters should have more confidence in their assessment of their perceived behavioral control, as it is based on direct experience. The increased confidence in perceptions should strengthen the relationship between behavioral control and intentions (H4).

In the belief elicitation interviews, described earlier, we also asked the interviewees to identify the main factors affecting their level of control over their telecommuting behavior. Self-efficacy, support, technology and workspace issues were identified as being of concern. Self-efficacy (H4d), or one's self-confidence in working without reliance on others, is seen in the literature (Bélanger and Collins, 1998; Teo, Lim and Wai, 1998) as critical to telecommuting intention. If one cannot work effectively and independently when telecommuting, then this work arrangement is probably unsuitable. Bélanger and Collins (1998) and Huws, Korte and Robinson (1990) note the importance of training - both for potential telecommuters and their managers - to ensure that the former have a high level of self-efficacy and the latter both appreciate this and can therefore trust that telecommuters will work as required. In addition to competence, telecommuters need to be well equipped (McCune, 1998) (H4a), as the availability of communication technologies has been shown to exert a significant positive impact on the perceived productivity, performance and satisfaction of telecommuters (Bélanger, Collins and Cheney, 2001). Associated with this availability is the cost of the technology itself, as well as the speed at which it becomes obsolescent (Venkatesh and Brown, 2001). Some organizations promote telecommuting programs as a way of saving costs, without realizing that telecommuters still need to use technology and that it is the organization's responsibility to ensure that appropriate technology is available. In addition, telecommuters also need both technical and non-technical support. (H4c). Apgar (1998) reports that telecommuters at IBM are treated as if they were customers when it comes to providing service. They can call a service support line that is precisely the same one used by regular IBM clients. Finally, the space that telecommuters have for work must be considered (H4b). Some organizations

choose to set up satellite work centers in local neighborhood districts (Fritz, Narasimhan and Rhee, 1998; Khalifa and Etezadi, 1997).

5.4. Habit

With repeated performance, a behavior becomes increasingly habitual. In such a case, habit emerges as an important predictor of future behavior over and above attitude, subjective norms and behavioral control (Conner and McMillan, 1999; Eagly and Chaiken, 1993; Godin, Valois and Lepage, 1993, Verplanken et al., 1997). While some researchers model habit as a moderator of the relationship between intention and habit, others have demonstrated the effects of habit on intention formation itself. In fact several studies have demonstrated that habit does not just moderate the relationship between intention and behavior, it also moderates the relationship between attitude and intention (e.g., Mittal, 1988; Verplanken et al., 1994). Triandis (1977) argued that there is an interaction effect between attitude and habit in the prediction of behavior. When habit is strong, the attitude-behavior relation is weak, whereas when habit is weak, the attitude-behavior link is strong, i.e. habit serves as a moderator variable. Verplanken et al. (1994) have reported a significant interaction effect of attitude and habit in explaining travel mode choice behavior. They concluded that the interaction between attitude and habit in the prediction of behavior suggested a tradeoff between attitude and habit, consistent with Triandis (1977), Bagozzi (1981) and Mittal (1988). As behavior becomes increasingly habitual it loses its reasoned character and is less guided by attitude (Verplanken et al., 1998). Our research model therefore includes a negative moderating effect of habit on the link between attitude and intention (H2).

6. Methodology

The research methodology consisted of two stages: 1) belief elicitation and 2) survey of intentions and beliefs. The purpose of the first stage was to elicit salient beliefs of current telecommuters regarding specific perceived consequences of telecommuting, various social influences (subjective norms) as well as behavioral control variables.

As with most prior studies on IT adoption and usage, relying on the same respondents for the assessment of intention and its antecedents is inevitable but is nonetheless a potential source of common method bias. This limitation, however, is alleviated by the structure of the research model, i.e. the moderating effects of habit. The moderating effects, if found to be significant, will provide a strong indication of the lack of common method bias (Evans, 1985). While the respondents may anticipate the linear relationships and answer accordingly, they are not likely to predict the moderating relationships. Existence of a common method bias statistically increases the covariance among the independent variables, impairing the likelihood of detecting a significant moderating effect. Therefore, with the verification of moderating effects, the presence of a common method bias becomes highly unlikely (Brockner et al., 1997).

As described earlier, the belief elicitation was undertaken through semi-structured interviews with 28 telecommuters and the results were used along with literature support to identify antecedents of the perceived consequences, subjective norms and behavioral control constructs. In the second stage, a survey instrument was constructed, pre-tested and then administered to current North American telecommuters. We approached 1500 companies across North America that are known to have formal telecommuting programs (identified through the Web and various publications). We contacted their human resources department and asked for the contact information of current telecommuters,

promising to inform them in return of the results of our survey. Slightly over 17.5% of the contacted companies (263 companies) responded positively, yielding a list of 488 telecommuters. We also obtained a separate list of 190 telecommuters in the USA from the Telecommuting Advisory Council (TAC). From these sources, we compiled a list of 678 current telecommuters. We randomly selected 28 of them for the belief elicitation process and we mailed the questionnaires to the remaining 650. To verify our assumption that deciding the level of telecommuting was indeed quasi-voluntary, we asked the respondents to specify the maximum level of telecommuting allowed by their organization. All 101 telecommuters who returned the questionnaire (a response rate slightly over 15%) indicated that they currently telecommute less than the maximum level permitted by their employers. The demographic profile of the respondents is described in Table 1.

Insert Table 1 about here

6.1. Measures

To ensure measurement reliability while operationalizing our research constructs, we tried to choose those items that had been validated in previous research. All constructs, except for quality of life, had reflective measures - congeneric indicators tapping into a latent first-order factor (Chin and Gopal, 1995). The quality of life construct was measured with three formative items, assessing the quality of social life, work life and family life. Detailed descriptions of actual wording and response scales are given in Appendix A. The scales for subjective norms, superior influence, peer influence, family influence, behavioral control, self-efficacy, and attitude were designed based on the scales used by Thompson, Higgins and Howell (1991, 1994), Bergeron et al. (1995), and Taylor and Todd (1995a). Although these scales were used in the context of adoption intention rather than intended level of continued usage, they were based on the original scales of the TPB, which were also used by Ajzen and Madden (1986) in the context of intended level of continued use. As for the operationalization of habit, we chose two commonly used overt measures. The first measure is a self-reported frequency of past behavior, which is traditionally used as an operationalization of habit (Ouellette and Wood, 1998). The second one is a self-assessment of the extent to which one's behavior has become habitual (adapted from Verplanken and Aarts (1999). On the question of which method of measuring habit is optimal, Verplanken and Aarts (1999, p. 110) stated that "self reported frequency of past behavior as well as self-reported habit may be useful methods". According to Ouellette and Wood (1998), the validity of past behavior as an indicator of habit depends on how accurately the respondents can report on their past acts. They further argue that "reports of act frequency are likely to be more accurate with rating scales that assess number of acts than with scales that use adjectives to reflect frequency" (Ouellette and Wood, 1998, p. 70). We therefore used the number of days as the measure of frequency of past behavior (see Appendix A).

To ensure face and discriminant validity of the measurement scales, we followed the item-sorting procedure (Churchill, 1979). In a first sorting round, five colleagues were asked to group the items into categories that made sense and to label these categories. In a second sorting round, five more colleagues were given the same items as well as the names of the constructs that these items were supposed to measure. Except for a few cases, the classifications done by the two groups of sorters were similar. Furthermore, the category names given by the first group of sorters were similar to the intended construct names. The placement ratios were all higher than .7 (in both rounds) and the degree of agreement of the sorters was also high with a kappa (Cohen, 1960) of 0.95. To pretest the resulting instrument, we administered a pilot survey to the individuals who participated in

the belief elicitation (28 telecommuters). After an examination of the Cronbach's alphas and correlation matrices, we realized that no changes were required.

6.2. Data Analysis

Since the measurement scales include both formative and reflective items, we opted for a partial least squares (PLS) analysis (Wold, 1989), using PLS-Graph (Chin, 1998). Tests of significance for all paths were conducted using the bootstrap resampling procedure (Cotterman and Senn, 1992). In evaluating the measurement models, we considered path loadings to be acceptable at 0.7 or higher. In assessing the internal consistency, we used the composite reliability measure developed by Werts, Linn and Jöreskog (1974). We also used the average variance extracted, considered by Fornell and Larcker (1981) to be a more conservative measure than the composite reliability. In assessing discriminant validity, we compared the square root of the average variance extracted for each construct to the correlations between it and the other constructs. We also examined the cross-loadings and removed all items that loaded higher on constructs other than the intended one. In formulating and testing the moderating effect of habit, we followed a hierarchical process similar to multiple regressions, where we compared the results of two models (i.e., one with and one without the interaction constructs: habit x attitude). We applied the procedure described by Chin, Marcolin and Newsted (1996), which is consistent with the guidelines recommended by Carte and Russell (2003). The standardized path estimate from the interaction construct to intention indicates how a change in the level of the moderator construct (habit) would change the influence of attitude on the dependent construct (intention). Thus, if habit has an estimated beta effect of B on satisfaction, a beta of M for the interaction path can be interpreted as a beta change of B+M for the estimated path from attitude to intention when habit increases by one standard deviation from the baseline of zero. To ensure that the moderating effects are tested and interpreted correctly, we follow the guidelines reported by Carte and Russell (2003).

7. Results and Analysis

To account for the possibility that common method variance might bias the results we conducted a Harman one-factor test (Podsakoff et al., 2003). Thirteen factors with eigenvalues greater than one emerged, with none of the single factors explaining over thirty percent of the total variance in the data, indicating that common method variance did not pose a significant threat. Figure 2 provides the results of the PLS analysis. The test of each hypothesis can be mapped to each specific path in the figure. The estimated path coefficients are given along with the associated t-statistics. All significant paths are indicated with one asterisk (*) for the 0.05 significance level and two asterisks (**) for the 0.01 significance level. The R² statistic is indicated next to each dependent construct. For all constructs, most of the items had reasonably high loadings (i.e. above 0.70) with the majority above 0.80, therefore demonstrating convergent validity. Furthermore, all items were found to be significant (almost all at the 0.01 level). Table 2 presents the loadings (weights for formative items), standard errors and t-statistics of the items to their respective constructs. The composite reliability measures (see ρ in Table 2) and the average variance extracted (see Table 3) provided additional support for reliability and convergent validity. The discriminant validity of the measurement model was also verified, with the square root of the variance extracted for each construct higher than the correlations between it and the other constructs (see Table 3).

Insert Figure 2 and Tables 2&3 about here

The model explains some 49.2% of the variance in telecommuters' intentions regarding their future level of telecommuting. The results indicate that habit (H2) moderates negatively the relationship between attitude and intention. The moderating effect is small as indicated by an f^2 of 0.06 (Aiken and West, 1991) [$f^2 = [R\text{-square}(\text{interaction model}) - R\text{-square}(\text{main effects model})] / [1 - R\text{-square}(\text{main effects model})]$]. It is nevertheless significant, supporting the view of several researchers (e.g., Mittal, 1988; Verplanken et al., 1994) that as behavior becomes increasingly habitual it is less guided by attitude (Verplanken et al., 1988). Such an interpretation of the moderating effect is consistent with "Principle II" suggested by Carte and Russell (2003).

Despite the negative moderating effect of habit, attitude (H1) continues to have a moderate effect on intention (significant path coefficient of 0.293). However, the magnitude of the effect of attitude is not significantly stronger than that of subjective norms, contrasting with the results reported by Karahanna, Straub and Chervany (1999). Subjective norms (H3) continue to exert a moderate effect on intention even after adoption (significant path coefficient of 0.291). As for behavioral control (H4), its effect is the weakest (path coefficient of 0.195) but is nevertheless significant. The significant effects of both subjective norms and behavioral control on intention support our argument for including both constructs in explaining continuance intention in the telecommuting context.

67.9% of the variance in the subjective norms (H3) is explained by the three antecedent factors that we identified through the belief elicitation process. Of these, the most important is peer influence (H3c) (path coefficient of .475). We believe that peer influence reflects the organizational culture. If the organizational culture actively and enthusiastically promotes telecommuting, it is likely that this value will be reflected in the attitude of members of the organization - i.e. one's peers. Superior influence (H3a) (path coefficient of .206) also significantly affects subjective norms, though to a lesser extent than peer influence. While the attitude and support of superiors is no doubt important for the continuance of telecommuting, it is insufficient - the organizational culture, and hence the reward system, must also support it as a desirable behavior. Family influence (H3b) (path coefficient of .267) also continues to be significant for the telecommuter's behavior after adoption.

71.5% of the variance in attitude (H1) is explained by the specific perceived consequences of telecommuting, which we identified through the belief elicitation process. The prominence of productivity (H1b) (path coefficient of .384) as the main consequence of telecommuting is consistent with the literature, followed by quality of life (H1c) (path coefficient of .28) and economic benefits (H1a) (.241). Finally, the significance of career development (H1d) (.107) should not be ignored, as telecommuting must at least not harm career prospects for it to be continued. The relatively high R^2 (71.5%) and the significance of all path coefficients indicate that the belief elicitation process captured an important part of the perceived consequences of telecommuting.

64.5% of the variance in behavioral control (H4) is explained by the four antecedent factors, yet only two of these have significant effects. Self-efficacy (H4d) (.677) is found to be clearly the most significant of the antecedent factors. The importance of self-efficacy is critical since it leads to independence from support mechanisms. Indeed, this also explains the lack of importance of support (H4c) (.02). Most people already possess the required hardware and software, and many companies have already developed corporate intranets, making technology a less important factor (H4a) (.08). If an employee cannot function effectively alone, additional support and the provision of technology are

unlikely to make a significant difference. Functioning effectively may be easier, however, when suitable workspace (H4b) (.157) is available - whether this is at home or in a satellite telecommuting center. Self-efficacy also relates to job and task suitability - neither are all tasks nor indeed, by correspondence, are all job natures suitable for the telecommuting mode of work. It is notable here that the internal behavioral control factor (self-efficacy) has a greater effect than the external ones.

8. Discussion

Prior research on post-adoption usage and IS continuance has cast doubt on the applicability of some of the TPB constructs, i.e., subjective norms and behavioral control. In this research, we argue and empirically demonstrate that with the inclusion of the moderating effects of habit, the TPB provides a good explanation of the continuance level of telecommuting behavior. Using Orlikowski and Iacono's (2001) argument for not treating all IT artifacts in a monolithic fashion, we argue for the distinctiveness of the telecommuting context. We demonstrate this distinctiveness in terms of the significance and relative importance of the determinants of the intended continuance level as well as the attitudinal, subjective norm and behavioral control variables that are specific to telecommuting.

The empirical results show that despite the negative moderating effect of habit, attitude maintains a significant effect on the intended continuance level. Subjective norms also continue to exert a moderate effect on intention. As for behavioral control, its effect is the weakest but is nevertheless significant. The significant effects of both subjective norms and behavioral control and the similarity of the magnitudes of the effects of attitude and subjective norms contrast with the results reported by Karahanna, Straub and Chervany (1999), supporting our arguments for the distinctiveness of the telecommuting context. The distinctiveness of telecommuting is also indicated in the specific determinants of attitude, behavioral control and subjective norms. The use of the belief elicitation approach for identifying these determinants has proven to be effective, as indicated by the relatively high explained-variances. The identification of these factors enhances the applicability of the TPB to the specific context of telecommuting. Indeed the demonstration and the enhancement of the applicability of the TPB to explaining the intended continuance level of telecommuting represent an important theoretical contribution. In stipulating the applicability of the TPB, we based our justifications on the quasi-voluntariness of telecommuting, arguing that this quasi-voluntariness is captured in the effects of the behavioral control construct (for IT and other constraints) and the subjective norms construct for the influences of significant others. Future research should investigate other contexts where IT usage is constrained in a similar way in order to develop a better understanding of quasi-voluntary continuance behavior. An example of such a context is the usage of collaborative technologies where the individual behavior is contingent upon the level of participation and influences exerted by significant others.

As for the practical implications of this study, they are numerous. Although most of the hypothesized factors were found to be significant, a few of them emerged as being particularly important, i.e., peer influence, productivity, and self-efficacy. It is essential to consider these factors seriously in assessing and improving telecommuting programs, since they are likely to play an important role in determining the level of telecommuting that occurs. Organizations could employ these factors in focus group discussions with current telecommuters, so as to learn how the telecommuting experience can be enhanced and so how the level of future telecommuting can be optimized, according to personal as

well as organizational needs. Communication between the organization and its telecommuters has been demonstrated in prior research to be a critical component of subsequent telecommuting program success (DeSanctis and Monge, 1999; Harrington and Ruppel, 1999). Key concerns for telecommuters are expected to be self-efficacy, productivity, and peer support, though career development, economic benefits and quality of life will also be important. The self-efficacy and productivity concerns can be addressed by providing the appropriate productivity tools and training to potential telecommuters and their managers. Peer support and career development concerns are interrelated and require new approaches to organizing, informing and evaluating workers.

9. Limitations and Conclusions

This research has a number of limitations that should be addressed in future work. Based on the TPB and the results of previous studies (e.g. Venkatesh, Morris and Ackerman, 2000), we assumed that intentions are good predictors of continuance behavior. Such an assumption still needs to be verified in the context of telecommuting through a longitudinal study. Also, our survey involved current North American telecommuters. We recommend caution in generalizing our results to other populations. It would be valuable to replicate this study in other parts of the world where cultural differences may produce quite different results. For example, in some parts of South East Asia, the Power Distance (Hofstede, 1991) between superiors and subordinates is much greater than is the case in North America. This will exert an impact on the importance attached to face-to-face relations, as well as the extent to which superiors trust subordinates to work independently. Differences along the individualism-collectivism continuum (Hofstede, 1991) can determine the relative importance of different social factors. In societal cultures with a strong 'collective' mentality, the influencing role of the family at home and superiors in the office may be much stronger than we detected in this research, which was conducted in North America where a more 'individualist' societal culture prevails. Indeed, Kurland and Egan (1999) note that telecommuting "fosters and rewards individualism", thus lending further support for the notion that it may well be a more appropriate work design in individualistic societal cultures, or organizational cultures that want to encourage the development of individual responsibility, for example in the context of an empowerment initiative (cf. Davison and Martinsons, 2002). At the same time, group-based organizational cultures that emphasize sharing and development may enable "the impetus for perceptions of trustworthiness" (Harrington and Ruppel, 1999, p. 234) and so promote values that facilitate telecommuting. We still have much to learn insofar as culture, in its myriad forms, affects telecommuting behavior. Indeed, in different cultural contexts, the suitability of the model itself may be challenged, since it was informed by models developed and by data collected in a North American cultural environment (cf. Chinese Culture Connection, 1987; Hofstede, 1987).

In light of the identified factors and their implications we can begin to understand why some telecommuting programs are not attractive. By knowing what really matters to telecommuters, we are in a position to explain how telecommuters may maintain and increase their level of telecommuting. The mere existence of a telecommuting program is certainly insufficient to ensure the desired level of telecommuting. Such a program needs to be carefully crafted so that telecommuters can realize their key objectives. Organizations that wish to develop telecommuting programs need to pay special attention to the extent to which telecommuters believe that they can work productively, possess the requisite skills to work independently, and where colleagues also believe that telecommuting is a smart way to work. The absence of any one of these conditions should

give an organization considerable pause for thought as to the likely value to be accrued through the development and continued operation of a telecommuting program.

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Appendix A – Measures

Intended Level of Telecommuting Continuance

Intended level of telecommuting in the next 12 months

Intention 1: Proportion of job to be done remotely instead of in the office

7-point scale: none, less than 10%, 10%-30%, 30%-50%, 50%-70%, 70%-90%, > 90%

Intention 2: Frequency (number of days per week) of telecommuting

7-point scale: none, less than 1 day, 1-2 days, 2-3 days, 3-4 days, 4-5 days, more than 5 days

Attitude

Attitude 1: Telecommuting is beneficial to me

Attitude 2: very bad, bad, slightly bad, neither bad nor good, slightly good, good, very good

Attitude 3: very unpleasant, unpleasant, slightly unpleasant, neither unpleasant nor pleasant, slightly pleasant, pleasant, very pleasant

All other items measured the level of agreement/disagreement of the respondents with various statements on a Likert-type scale with 7 levels (strongly disagree, disagree, slightly disagree, indifferent, slightly agree, agree, strongly agree).

Subjective Norms

Subjective Norm 1: People who influence my behavior think that I should telecommute

Subjective Norm 2: People who are important to me think that I should telecommute

Superior Influence

Superior Influence 1: My boss/superior thinks that I should telecommute

Superior Influence 2: I am encouraged to telecommute by my boss/superior

Peer Influence

Peer Influence 1: I am encouraged to telecommute by my colleagues

Peer Influence 2: My colleagues think that I should telecommute

Family Influence

Family Influence 1: I am encouraged to telecommute by my family

Family Influence 2: My family thinks that I should telecommute

Economic Benefits

Economic Benefits 1: For me, the economic benefits of telecommuting outweigh its costs

Economic Benefits 2: Telecommuting is economically beneficial to me

Economic Benefits 3: Telecommuting has effectively reduced my expenses

Productivity

- Productivity 1: I am more productive with telecommuting than without telecommuting
- Productivity 2: Telecommuting has effectively improved my work productivity
- Productivity 3: My overall productivity increased because of telecommuting

Quality of Life

- Quality of Life 1: Telecommuting has improved the quality of my work life
- Quality of Life 2: Telecommuting has improved the quality of my family life
- Quality of Life 3: Telecommuting has improved the quality of my social life

Career Development

- Career Development 1: Telecommuting helps my career
- Career Development 2: My career development is positively affected by telecommuting
- Career Development 3: Telecommuting improves my career advancement

Behavioral Control

- Behavioral Control 1: Telecommuting is entirely within my control
- Behavioral Control 2: I have the resources and the knowledge and the ability to telecommute effectively

Self-Efficacy

- Self-Efficacy 1: I feel comfortable working remotely on my own
- Self-Efficacy 2: I can easily work remotely
- Self-Efficacy 3: I am capable of working effectively from a remote location

Support

- Support 1: The technical and logistic support for telecommuting provided to me are appropriate
- Support 2: The overall support for telecommuting available to me is suitable

Workspace

- Workspace 1: I have a suitable remote work environment
- Workspace 2: My remote work facility is appropriate

Technology

- Technology 1: I have access to the appropriate technology for telecommuting
- Technology 2: I have access to the appropriate hardware/software for telecommuting

Habit

- Habit 1: Frequency (number of days per week) of current telecommuting
- 7-point scale: none, less than 1 day, 1-2 days, 2-3 days, 3-4 days, 4-5 days, more than 5 days
- Habit 2: Telecommuting is a habit for me
- Likert-type scale with 7 levels (strongly disagree, disagree, slightly disagree, indifferent, slightly agree, agree, strongly agree)

Table 1: Demographics

Demographic	Category	Percentage
Gender	Male	44.6%
	Female	55.4%
Age Group	Less than 30	11.9%
	30-40	30.7%
	40-50	40.6%
	Over 50	16.8%
Marital Status	Married	79.2%
	Single	18.8%
	Other	2.0%
Number of Dependents	0	39.8%
	1	20.4%
	2	26.5%
	3	8.2%
	4	3.1%
	5	2.0%
Industry Sector	Manufacturing	2.0%
	Government	38%
	Service	37%
	Other	23%
Total Daily Commute Time	Less than 10 minutes	21.2%
	10-30 minutes	26.3%
	30-50 minutes	20.2%
	Over 50 minutes	32.3%
Formal Telecommuting Program	Yes	66.3%
	No	33.7%
Job Function	Manager/supervisor	59.4%
	Non-manager/Non-supervisor	40.6%

Table 2: Measurement Statistics

Reflective Constructs		Loadin g	Std. error	t-statistic
Subjective Norms $\rho = 0.9258$	Subjective Norms 1	0.9257	0.0208	44.4227
	Subjective Norms 2	0.9311	0.0160	58.2412
Superior Influence $\rho = 0.7493$	Superior Influence 1	0.9641	0.0238	40.4790
	Superior Influence 2	0.5505	0.1657	3.3228
Peer Influence $\rho = 0.8779$	Peer Influence 1	0.8962	0.0183	48.9928
	Peer Influence 2	0.8728	0.0413	21.1414
Family Influence $\rho = 0.8290$	Family Influence 1	0.7597	0.0843	9.0112
	Family Influence 2	0.9178	0.0227	40.4718
Attitude $\rho = 0.9250$	Attitude 1	0.9135	0.0265	34.4572
	Attitude 2	0.8758	0.0406	21.5972
	Attitude 3	0.9010	0.0404	22.3076
Economic Benefits $\rho = 0.8567$	Economic Benefits 1	0.7919	0.0858	9.2344
	Economic Benefits 2	0.9034	0.0223	40.4890
	Economic Benefits 3	0.7475	0.0793	9.4203
Productivity $\rho = 0.9265$	Productivity 1	0.9205	0.0231	39.8185
	Productivity 2	0.8322	0.0895	9.2984
	Productivity 3	0.9404	0.0150	62.6212
Career Development $\rho = 0.9223$	Career Development 1	0.9114	0.0146	62.4719
	Career Development 2	0.8667	0.0416	20.8340
	Career Development 3	0.9018	0.0407	22.1310
Behavioral Control $\rho = 0.7898$	Behavioral Control 1	0.8156	0.0550	14.8163
	Behavioral Control 2	0.8001	0.0746	10.7266
Self-Efficacy $\rho = 0.9129$	Self-Efficacy 1	0.9224	0.0239	38.6538
	Self-Efficacy 2	0.9174	0.0267	34.3052
	Self-Efficacy 3	0.8014	0.0638	12.5703
Support $\rho = 0.9206$	Support 1	0.9025	0.0899	10.0357
	Support 2	0.9441	0.0984	9.5914
Workspace $\rho = 0.9707$	Workspace 1	0.9749	0.0075	129.5509
	Workspace 2	0.9674	0.0127	76.0675
Technology $\rho = 0.9339$	Technology 1	0.9326	0.0247	37.6973
	Technology 2	0.9393	0.0259	36.2504
Habit $\rho = 0.8940$	Habit 1	0.9002	0.0663	13.5862
	Habit 2	0.8979	0.0738	12.1725
Intention $\rho = 0.9706$	Intention 1	0.9751	0.0085	114.3388
	Intention 2	0.9670	0.0103	94.2121
Formative Construct		Weight	Std. error	t-statistic
Quality of Life	Quality of Work Life	0.6064	0.1380	4.3954
	Quality of Family Life	0.2998	0.1411	2.1243
	Quality of Social Life	0.2763	0.1234	2.2392

Table 3 - Correlation among construct scores (square root AVE in diagonals)

	Attitude	Intention	Subjective Norms	Behavioral Control	Superior Influence	Family Influence	Peer Influence	Technology	Support	Workspace	Self-Efficacy	Economic Benefits	Productivity	Career Development	Habit
Attitude	0.897														
Intention	0.510	0.971													
Subjective Norms	0.606	0.540	0.928												
Behavioral Control	0.156	0.289	0.132	0.808											
Superior Influence	0.458	0.499	0.596	0.219	0.785										
Family Influence	0.518	0.443	0.650	0.270	0.426	0.843									
Peer Influence	0.515	0.464	0.770	0.163	0.554	0.593	0.885								
Technology	0.231	0.260	0.291	0.443	0.146	0.222	0.321	0.936							
Support	0.283	0.212	0.192	0.313	0.204	0.253	0.162	0.673	0.924						
Workspace	0.404	0.346	0.297	0.482	0.161	0.309	0.235	0.517	0.434	0.971					
Self-Efficacy	0.043	0.190	0.101	0.778	0.151	0.148	0.145	0.393	0.250	0.404	0.882				
Economic Benefits	0.628	0.477	0.443	0.269	0.463	0.510	0.331	0.185	0.231	0.424	0.159	0.817			
Productivity	0.776	0.480	0.564	0.209	0.392	0.587	0.415	0.227	0.290	0.458	0.116	0.553	0.899		
Career Development	0.527	0.290	0.547	0.115	0.442	0.340	0.561	0.262	0.224	0.245	0.112	0.339	0.470	0.894	
Habit	0.050	0.295	0.020	0.008	0.061	0.073	0.024	0.097	0.117	0.196	0.050	0.047	0.228	0.023	0.899

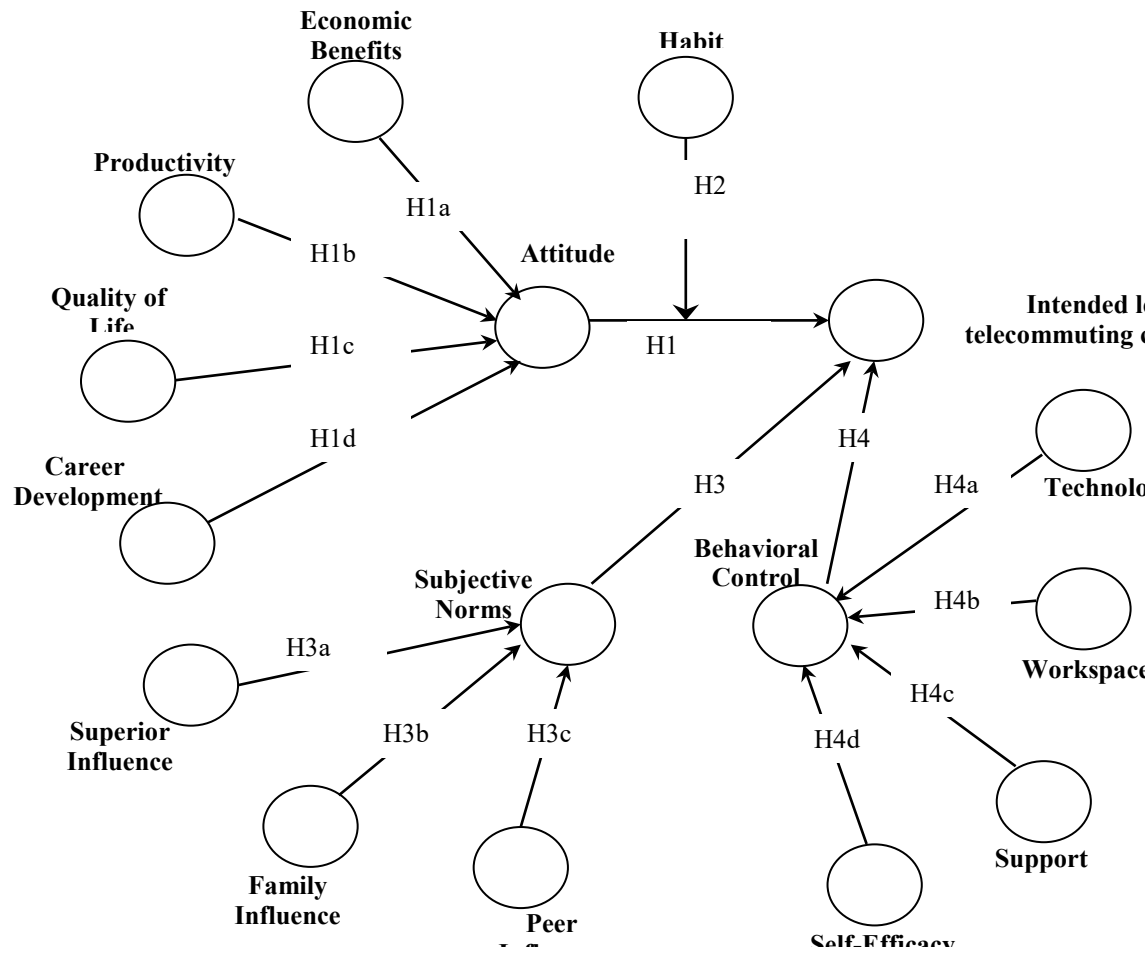


Figure 1: Research Model

