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A Taxonomy of Employee Motives for Telework

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Abstract

This qualitative research contributes to the telework research literature by identifying and categorizing employee motives for teleworking. Motives for telework contextualize teleworking behavior, represent proximal telework outcomes, and serve as potential boundary conditions for telework-outcome relationships. Role identity theory (Burke & Tully Social Forces, 55(4), 881-897, 1977) and the uncertainty-reduction hypothesis (Hogg & Terry Academy of Management Review, 25, 121-140, 2000) suggest that motives may be driven by role salience and the ability to meet work and nonwork demands. In this research, we sought to identify a comprehensive list of motives as well as reconcile the wide range of categories and labels given to telework motives in the literature. We asked two independent samples of workers comprised of two subsamples of teleworkers $(n_1 = 195; n_2 = 97)$ and a subsample of nonteleworkers $(n_3 = 947)$ why they telework or would like to telework. A total of 2504 reasons were gathered across the three subsamples. Most respondents reported multiple reasons, especially when encouraged to list all of their reasons. After distinguishing preconditions from motives to telework, ten categories emerged from the qualitative data with "avoid commute" emerging as the most frequently reported motive. Other frequently reported motives included "tend to family demands" and "productivity." Additional motives are discussed along with implications for telework research and policy development and implementation.

Keywords Telework · Telecommute · Motives · Reasons · Qualitative data

Telework/telecommuting, the discretionary act of periodically working from home or another remote location, typically via technology for some portion of one's work schedule, has become an increasingly widespread practice (Allen et al., 2015; Global Workplace Analytics, 2017; Matos et al., 2016), and even more common in the midst

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of the COVID-19 pandemic (Bouziri et al., 2020). These increases have been attributed to natural events, rising fuel costs, and organizational efforts to be more family-friendly. The federal government has supported this trend through Public Laws 108–199 and 108–447 in 2004, and the Telework Enhancement Act of 2010, promoting telework in federal agencies (US Office of Personnel Management, 2011). Clearly, telework has become not only a popular practice but an issue of national interest as well. This study focuses on telework motives with the objective of providing a comprehensive list of motive categories and prevalence data.

For the employee, telework motives are likely to determine (a) whether they request to telework, (b) how strongly they desire to do so, and (c) how frequently they telework (Hjorthol, 2006). Further, teleworking is likely to have a greater impact on outcomes (e.g., job satisfaction) when employees' needs are fulfilled. Perhaps even more importantly, supervisor attributions of whether an employee's motive to telework is more personal versus productivity-oriented can influence whether or not supervisors permit employees to telework, which can impact teleworker career outcomes (e.g., Leslie et al., 2012).

We contribute to the research literature in multiple ways. First, as we illustrate in our review of the previous literature, research on motivation to telework is haphazard, atheoretical, and piecemeal. We begin by identifying relevant theory that explains why some employees are likely to want to telework. Second, we demonstrate in our review that researchers have confounded motives with preconditions (necessary requirements) for telework. We differentiate preconditions from motives in our taxonomy of telework motives. Third, a relatively recent review of the telecommuting literature, Allen et al. (2015) noted the need for future research to provide more contextual information, specifically "reasons for telecommuting" (p. 61). We respond to this call by providing a comprehensive taxonomy of motives for researchers and practitioners to use when gathering these data and speculate on their applicability post-COVID. Fourth, previous reviews of the telework literature concluded that anticipated telework motives like commuting were not supported by the empirical research literature (Bailey & Kurland, 2002). We provide empirical evidence of the prevalence of motives in two independent samples of workers, one comprised of both teleworkers and nonteleworkers. Finally, very little research has explored the nomological net for telework motives. We provide correlations between the preconditions and motive categories with demographic and other telework (frequency and satisfaction) variables, testing the replicability Shockley and Allen's (2012) findings.

Why Are Employees Motivated to Telework?

Generally speaking, employees are motivated to fulfill their needs and to avoid aversive states (e.g., discomfort). In fact, researchers have noted that employees are inclined to proactively change aspects of their job in order to maximize motivation, reduce stressors, and mitigate strain (Parker & Ohly, 2008). Theoretically, role identity theory (Burke & Tully, 1977) and the uncertainty-reduction hypothesis (Hogg & Terry, 2000) suggest that employees are likely to have motives to fulfill goals that align with their most salient role and seek strategies that help reduce uncertainties that interfere with



that role. Despite theories indirectly supporting the desire to telework, studies of telework motives have been largely atheoretical.

According to role identity theory, individuals form identities based on the salience of the various roles that they occupy (Burke & Reitzes, 1991; Kossek et al., 2012; Thoits, 1991). Work and family roles are some of the most salient. Additionally, physical work environments contribute to the formation of identities (Ashkanasy et al., 2014). The most salient role (e.g., work-related or family-related) will determine the centrality of the individual's identity (i.e., work-centered or family-centered, respectively). Alternatively, a dual-centered identity may emerge if both work and family roles are equally salient. Generally, individuals are motivated to fulfill goals aligned with their role identity and to seek out circumstances that help them to meet work and family demands. This has implications for where individuals prefer to work, thus telework motives. Ironically, the environment that is most conductive to getting work done is not necessarily the traditional work environment because of interruptions and distractions. In fact, the environment that helps employees meet work and family demands may be a location facilitates the fastest role transitions.

Naturally, identities may change over the course of one's life as various roles become more prominent (e.g., becoming a parent, getting a promotion), and the salience of roles may change even more frequently given daily demands and unique events (e.g., work deadline, child performing in a play). In addition, the locations that facilitate meeting work and family demands may change. For example, many parents needed to work at home during the pandemic because their children were attending school virtually.

The uncertainty-reduction hypothesis proposes that individuals are motivated to reduce feelings of uncertainty and increase the amount of control they feel over situations (Hogg & Terry, 2000). For example, an employee with an extensive commute may be unsure how long it will take to drive from work to after-school care and then to a child's piano lesson due to unpredictable traffic-related issues. Because of this, he may be motivated to work from a location in which the commute is shorter and therefore more predictable. Another uncertainty is whether urgent issues or interruptions by colleagues will arise at the main worksite and interfere with the ability to get time-sensitive work done. To reduce this uncertainty, the employee may be inclined to telework. Similarly, an immune-compromised employee may prefer the reduced risk of exposure to other individuals carrying infectious diseases.

Likewise, uncertainties can also arise at home that may motivate an employee to work at the main worksite. For example, barking dogs at home can interfere with important conference calls, so to reduce the possibility that this might occur, the employee may choose to not telework on days with important calls. Taken together, role identity theory (Burke & Tully, 1977) and the uncertainty-reduction hypothesis (Hogg & Terry, 2000) suggest that employees are likely to be motivated to minimize the uncertainties that interfere with their ability to fulfill their role demands, particularly the ones they identify with most. Telework programs traditionally give employees discretion over where they work which can help them meet work and nonwork demands. This is an important distinction from situations that force one to telework (e.g., a pandemic). Correspondingly, telework motives are likely to align with strategies that facilitate meeting work and nonwork demands.



Telework Motives Research

A careful review of the telework literature reveals a haphazard assortment of buried motives sometimes initially identified as advantages of telework or inferred based on demographic characteristics of teleworkers. Our review yielded eight empirical studies that explicitly report telework motives/reasons for teleworking often as a list in a table with frequency counts. We depict these studies in chronological order across the top of Table 1 and by motive categories down the left side. This table illustrates that telework motive categories have been confounded with preconditions (requirements necessary for telework), vary in specificity/breadth, and have been inconsistently labeled across studies. By organizing

Table 1 Studies Reporting Motives and Preconditions for Teleworking

Preconditions	Mokhtarian & Salomon (1997) and Mokhtarian et al. (1998) N = 628; N = 583	Stephens & Szajna (1998) N = 26 interviews	Bailey & Kurland (2002) N/A	Hjorthol (2006) N = 16 interviews	Tremblay et al. (2006) N = 23,000 workers across 6,000 firms Employer or	Wilton et al. (2011) N = 32 interviews Aspects of	MSPB (2011) N = 9,773	Shockley & Allen (2012) N = 206
(Work conducive to remote setting)					work requirements	work easily done at home		
Tend to family demands	Disability/parental leave (telework rather than take sick leave for this)	Family		Temporal and spatial aspects of coordinating family logistics	Family/personal obligations		The ability to better balance career and family obligations	Life management motives
Tend to nonwork demands	Personal benefits (time for self and other activities)			Nonwork demands (repair people, family appointments)	The desire to gain time	Maintenance; chores		Life management motives
Working conditions at home promote productivity		Working conditions			Better working conditions at home	More productive at home; informality	More productive at home	Work-related motives
Childcare		Child care	Pull: Childcare			Easier to collect the kids from daycare		Life management motives
Reduce commute	Commute time and commute stress	Commute	Lack of evidence for this			Reduced commute saves time, fatigue, reduces stress; avoid driving in bad weather	Commute time and distance	
	Mokhtarian & Salomon (1997) and Mokhtarian et al. (1998)	Stephens & Szajna (1998)	Bailey & Kurland (2002)	Hjorthol (2006)	Tremblay et al. (2006)	Wilton et al. (2011)	MSPB (2011)	Shockley & Allen (2012)
Avoid distractions at work		Distractions at work				Lack of personal office to avoid colleagues		Work-related motives
Avoid interruptions at work				Interruptions			Less interruptions at home	Work-related motives
Avoid/reduce stress at work	Work stress	Stress at work						Work-related motives
Social responsibility	Ideological	Social responsibility				Lower emissions		
Save employee money		Cost savings			The desire to spend less money on travel	Saving money on travel expenses		
Promotion potential		Promotability potential				спрепосо		Work-related motives
Novelty of the experience		Novelty	_					
Organizational costs			Push: Real estate costs; Labor costs					
Convenience/ Flexibility						Convenience flexibility		



these studies into one table, it is easier to see similarities and differences across the studies. Our review also revealed a number of limitations, which we review next.

Limitations of Past Telework Motives Studies

Whereas previous studies provide the foundation of our research and each has its own merit, our review also revealed a number of limitations inhibiting scientific progress in this line of research. First, many studies reporting telework motives were not designed to identify telework motives or their prevalence. Thus, the methods used to gather motives was often indirect and exploratory (e.g., Stephens & Szajna, 1998), with motives being inferred them from a list of advantages (e.g., Wilton et al., 2011). These studies are largely atheoretical and many confounded motives with a lack of constraints (e.g., Mokhtarian & Salomon, 1997). Second, because of the piecemeal way in which research on telework motives has been conducted, researchers have not used the same terms and phrases for the motives within (e.g., Stephens & Szajna, 1998) and across studies, resulting in a wide-range of "motives" that vary in specificity, some of which represent a category of motives (e.g., nonwork; Shockley & Allen, 2012). Many of the labels we encountered were confusing which inhibits comparisons across studies. For example, Hjorthol (2006) organized motives for telework into three categories, one which was labeled "the double character of working life." This is particularly confusing as closer examination of this study reveals that this label was associated with the extent to which employees seek the opportunity to work without interruption.

Third, some telework motive studies lack methodological and statistical rigor. For example, many are based on very small sample sizes (e.g., Hjorthol, 2006; Stephens & Szajna, 1998; Wilton et al., 2011). Sometimes researchers assume employee motives fit within a predetermined list and then gather ratings using this list (e.g., MSPB, 2011; Shockley & Allen, 2012), which does not allow for unmeasured motives to emerge. Additionally, researchers did not always allow for teleworkers to convey more than one motive, sometimes collapsed multiple motives together when reporting frequencies, and often failed to convey the prevalence of each motive identified. Therefore, it is unclear as to what extent individuals engage in telework for multiple motives or how idiosyncratic a given motive might be.

Fourth, the nature of the telework arrangement (or lack thereof) and the frequency with which employees telework varies across studies, making it difficult to know if these differences contribute to the different motives that emerge. This variability is not surprising given the lack of one accepted definition of telework (Allen et al., 2015; Mokhtarian & Salomon, 2005). For example, sometimes, the telework arrangement appears to include flextime in which employees determine their start and stop work times (Hjorthol, 2006). As a result, employee motives for these arrangements may align more with the flextime portion of their arrangement than the flexplace. Sometimes samples include nonteleworkers (e.g., Mokhtarian & Salomon, 1997; Stephens & Szajna, 1998), but comparisons between these groups are not always made. Sometimes remote workers (i.e., individuals who work exclusively from a remote location) are included (e.g., Morganson et al., 2010). Some studies examine motives for teleworking exclusively during nontraditional work hours (Tremblay et al., 2006). Finally, some studies are dated and therefore may not reflect current motives. Ignoring meaningful differences in the



conceptualization and operationalization of telework (Allen et al., 2015; Golden, 2012) complicates the conclusions we derive from the data as well as policy implementation recommendations. Although we have identified multiple limitations in previous studies, no study is perfect. Next, we summarize what we learned from a review of this literature.

Summary

Nearly all of the telework motive studies included in Table 1 mentioned tending to family demands and/or the broader category of nonwork demands. This is not surprising given the number of studies that have examined work-family conflict as an outcome of teleworking (e.g., Golden et al., 2006). Two other very common motives were productivity (e.g., Olson & Primps, 1984) and reducing/eliminating the commute (e.g., Wilton et al., 2011). The next two most frequently identified motives were relatively similar – avoiding distractions and avoiding interruptions at work. Equally frequent were the desire to avoid stress at work, social responsibility relating to lower emissions from less commuting, and saving the employee money.

Two studies identified aspects of work as motives for telework (Tremblay et al., 2006; Wilton et al., 2011). Although these are important precursors to telework, they are *preconditions for telework* rather than motives. We define preconditions for telework as situational conditions usually beyond the employee's control that determine whether or not an employee has the opportunity to telework. It is important to differentiate preconditions from motives for telework because, preconditions are necessary in order for employees to telework in the first place. Thus, motives are unlikely to result in teleworking without preconditions. Further, nonteleworkers may be more likely to list preconditions as motives for telework than teleworkers, as when they are not in place, they are perceived as barriers to opportunities to telework.

Although it did not emerge from the peer-reviewed literature, many popular press articles, pictures, and cartoons/memes tout other reasons why people might telework, including the ability to wear more casual clothes and work in a more comfortable physical environment (Standen, 2000). Thus, formal physical environments and the formal attire required in that environment sometimes make working at the main worksite less desirable. Further, the most common off-site work location is one's home (BLS, 2013), which can be more comfortable and may result in spending less money on meals and clothes.

In their review of the telework literature, Bailey and Kurland (2002) attempted to answer the question "why do individuals telework?" At that time, very few studies had directly asked employees this question. Instead, researchers inferred reasons for teleworking based on demographic characteristics like sex, number of children, and commute time. Bailey and Kurland (2002) identified two broad telework motives based on the historical conceptualization of telework: 1) supply (employer) forces that *push* employees out of the office (e.g., real estate and labor costs) and 2) demand (employee) forces that *pull* employees into an alternative workplace (e.g., childcare, commute). These motives are not mutually exclusive; thus an employee may report both supply and demand motives. Bailey and Kurland noted that most research to date at that time had focused on demand forces and that "commute factors do not appear to be the primary motives for telework" (p. 387). They also note that "evidence to date thus



undermines the hypothesis that family concerns will drive women to telework" (p. 388). After discussing some possible organizational factors that may contribute to the decision to telework (e.g., firm size), they conclude with "expected motivations for individuals to pursue telework have not been borne out, leaving [unanswered] the question of why some employees opt to work remotely" (p. 389). Given the considerable research literature on the undesirability of commuting time and strain (e.g., Evans & Wener, 2006; Stokols & Novaco, 1981), it is likely that avoiding the commute has become a more predominant motive.

In a study investigating employees' motives for using flexible work arrangements, Shockley and Allen et al. (2015) set out to determine whether employees are driven more by life-management or work-related motives. They attribute these categories of motives to Sullivan and Lewis (2001) who conducted interviews with 14 teleworkers and their co-residents. Sullivan and Lewis (2001) reported that "consistent with previous research, the reasons that these teleworkers give for working at home are highly gendered" (p. 130). For example, women were more likely than men to report teleworking for childcare reasons. In contrast to these findings and contrary to gender role norms (Harris & Firestone, 1991). Shockley and Allen et al. (2015) found no gender differences in life management motives and that women were significantly more likely to report work-related motives than men. They also found that faculty members were motivated by work-related motives significantly more than life management motives. They acknowledge their sample of university faculty is likely to have more egalitarian views and call for additional research using different samples of workers.

Research Questions

As depicted in the first column of Table 1, up to 15 different categories of motives have been presented in the literature and one of these categories is more appropriately labeled preconditions. Given the wide-range of motives purported across studies, the varying telework samples, and the inconsistencies across studies, we examined two independent samples of employees in order to compile a broad range of categories of motives for telework.

In order to gather a more comprehensive view of why an employee is motivated to telework, we also asked a large sample of nonteleworkers about their desire to telework if they were given the opportunity. Nonteleworkers were also sampled in the current study to empirically test if unfulfilled motives to telework (which may be even stronger than fulfilled motives) could be classified into the same taxonomy. Many employees who do not have the ability to work from home would like to and therefore can provide insight regarding the reasons for teleworking that may be overlooked or forgotten by employees who have teleworked for a considerable amount of time. By asking openended questions to three samples of employees from varying occupations and industries, we gathered sufficient data to generate a comprehensive taxonomy of motive categories. We also examine the prevalence of each motive category, their interrelationships with each other and demographic characteristics, and determine the extent to which teleworker and nonteleworker motives overlap.

RQ 1: What categories make up a comprehensive yet parsimonious telework motive taxonomy?



- RQ 2: What are the most prevalent telework motive categories?
- RQ 3: Does a taxonomy of teleworker motives to telework encompass nonteleworker motives to telework?

Based on this literature review, there are multiple possible telework motives. Because employee behaviors are often motivated by multiple factors (Mitchell & Daniels, 2003), employees can have more than one salient role identity, and telework motives are not mutually exclusive, it is possible that employees have multiple telework motives. Although it may seem intuitive that employees engage in telework for multiple reasons, researchers have not empirically examined this question. Further, research has shown that managers attribute employee decisions to use flexible work policies to either productivity or personal life and the latter attribution is associated with career penalties for the employee (Leslie et al., 2012). In fact, research has shown that managers assume employees who simply appear to need flexible work policies based on demographic characteristics are less committed to their work, a phenomena referred to as flexibility stigma (Williams, 2000). This assumption has been empirically associated with negative outcomes including negative career consequences (e.g., Glass, 2004). Identifying the extent to which employees possess multiple telework motives and how they correlate with one another reduce manager misattributions about motives for teleworking. Thus, we sought to determine the prevalence of multiple telework motives and the extent to which they covary with one another as well as employee characteristics.

- RQ 4: Are employees motivated to telework for more than one reason?
- RQ 5: To what extent are telework motives related to one another, demographic, and other telework variables (frequency and satisfaction)?

Method

Recognizing the complexity of the nature of human motives, a consensual qualitative research-modified (CQR-M; Spangler et al., 2012) approach was used to answer the current research questions. CQR is based in grounded theory (Fleming et al., 2014; Hill, 2012), but differs in several ways. In contrast to traditional grounded theory, a CQR-M approach (1) asks the same question of all participants, (2) multiple judges evaluate the responses, and (3) proportions of themes are quantified (Fleming et al., 2014). CQR-M provides an inductive or bottom up approach, in which themes and categories are derived directly from the data. By asking teleworkers to describe their motives or reasons in their own words, this methodology allows for a more complete description of teleworkers' and nonteleworkers' desires and goals.

Participants

Two samples of teleworkers and one sample of nonteleworkers were surveyed prior to the COVID-19 pandemic. Unlike previous research, which provided teleworkers with preconceived categories (Shockley & Allen, 2012) or limited the number of reasons



they could list (Tremblay et al., 2006), respondents were asked open-ended questions. Thus, their short narrative responses were the focal data used to answer our research questions.

Sample 1

The first sample was drawn from a Big 4 accounting firm headquartered in the New England area. This company had a formal telework policy in which employees could have on file with the Human Resource Department an agreement with their supervisor to work from home on a regular to full-time basis. This company also strived to be relatively proactive with regard to having family-friendly policies. The survey was sent to a random sample of 1500 employees stratified on function or business (e.g., tax, consulting) and geographical location and an additional 60 employees who had a formal telework agreement on file. A total of 342 employees responded for a 22% response rate. By embedding skip logic into the survey, telework-specific questions were only administered to the 195 employees who identified themselves as either a formal or informal teleworker. In this sample, women (n = 111, 56%) slightly outnumbered men (n = 84, 43%). On average, respondents were 36.17 (SD = 9.52) years of age with approximately five years of organizational tenure (M = 5.46, SD = 5.39).

Sample 2

The second sample was drawn from a large Department of Defense contractor with facilities in Dallas, TX and Orlando, FL. The firm had a reputation of not being very family-friendly but some supervisors permitted informal telework. Many employees had expressed frustration over taking work home but not being allowed to bill clients for that time or to telework during normal business hours. The survey was sent to 2130 employees and 1045 responded for a response rate of 49%. Respondents identified themselves as teleworkers or nonteleworkers in the survey, thus this sample was divided into a subsample of 97 teleworkers (Sample 2a) and 947 nonteleworkers (Sample 2b; one person could not be classified). In this sample of teleworkers, women (n = 28, 29%) were outnumbered by men (n = 60, 62%). On average, respondents were 39.83 (SD = 10.02) years of age with nearly eight years of experience (M = 7.94, SD = 5.99). The majority of the nonteleworkers were male (n = 549, 58%), tended to be younger than the other two samples (M = 30.77, SD = 5.71), and had worked an average of six years in their organization (M = 6.17, SD = 4.31).

For both Samples 1 and 2, employees were sent an email from the human resource office requesting their participation and provided with a hyperlink to the web-based survey. The employees were given three weeks to complete the survey and multiple reminders were sent via email. Teleworking was defined for respondents in both surveys. For Sample 1, text on the survey read: "Telework, or telecommuting, is a flexible work arrangement that allows workers to conduct some or all of their work at a location away from the main worksite (a [Organization Name] office or client location), usually at home. Employees at [Organization Name] can either telework formally or informally. A formal teleworker has a documented agreement in which they work from home a certain number of hours a week. An informal teleworker does not have an official telework



status, but they work from home when they wish." For Samples 2a and 2b, the text on the survey read, "For this study, telework is defined as working away from the main office or a customer location during some or all traditional work hours (8am-5pm)."

Survey Questions and Responses

Teleworkers in Sample 1 were asked the open-ended question: "Why do you telework?" Recognizing that Sample 1 responses may not have been exhaustive, teleworkers in Sample 2a were prompted to "Please list all of the reasons why you telework." Nonteleworkers in Sample 2b were prompted to "Please list all of the reasons why you would like to telework, if it were an option for you." When asked to rate a separate question about the extent to which they would like to be able to telework, 25 nonteleworkers indicated that they would not be interested at all.

Coding of Survey Responses

The authors met to discuss their expectations and assumptions about telework motives. Consistent with CQR-M, the authors identified relatively mutually exclusive categories by making a list of motives that they anticipated would emerge based on the current literature. Two authors conducted a line-by-line analysis and open coding for the individual responses in Sample 1, identifying categories that emerged (Strauss & Corbin, 1990). Many responses contained more than one motive, so the coders agreed to allow for each response to be coded into more than one category. For example, the bulleted response "- Save time/money on commuting - Flexibility with children - Less in-office distractions" was coded as commute, family demands, and productivity. The authors compared categories that emerged, discussing how they were defined and any inconsistencies in conceptualizations to achieve a common understanding of each category. An initial list of eight categories included a refinement of the preliminary categories identified from the research literature (commute, family/dependents, productivity, personal need), as well as an identification of emergent themes in the current data (inconvenient work hours, nature of the work, no need to be in the office, and personal preference/convenience).

This iterative process ensured that more than one perspective was considered in the assessment of each response, as well as the categories that emerged. CQR-M allows for a more holistic description of the "domains to emerge from the data itself so that new, and potentially unexpected, ideas are not lost" (Fleming et al., 2014, p. 9). Once the coders reached a common understanding about the categories (i.e., saturation was achieved), the coders discussed each survey response and came to consensus on its categorization. The percentage of agreement among raters was high (93%). Disagreements were resolved to consensus by each rater explaining her rationale, consulting the working definitions of the categories, and sometimes bringing in a third author to provide a third rating and facilitate consensus conceding to the rater who could provide the most defendable explanation as well as ensuring consistent rating of similar responses. For example, sometimes responses were vague like "Appointment or something that needs to be worked around." It is unclear if the respondent is referring to work-related appointments which might be coded as the nature of



the work or inconvenient work hours or personal appointments (e.g., medical) which would be coded as personal illness or medical. Ultimately, the raters agreed to assume the respondent was referring to personal appointments and to code it accordingly.

For Sample 2a and 2b, two authors started with the categories from Sample 1 and categorized each response. They also added new categories (e.g., exercise) that emerged from the data and split the financial category into two categories, one capturing individual employee expenses and one capturing organizational costs and expenses.

After all the responses were coded, the authors examined the prevalence of responses within each category (See Table 2; RQ 2 and RQ 3) and agreed to collapse the individual and organizational financial categories back into one financial category. Also, narrow categories with a small number of responses (e.g., exercise) were collapsed into broader categories (e.g., personal preference). This resulted in a 12-category taxonomy (10 motives and 2 preconditions) that appeared comprehensive (RQ 1), as all responses from the three samples could be classified into it and the categories were described with a similar level of detail (RQ 3). The various motives identified in the research literature can also be categorized into the taxonomy identified in the current study. Example quotes appear in the results section and Fig. 1 to illustrate the categories in participants'

Table 2 Telework Preconditions and Motives by Sample

Precondition/Motive Categories	Teleworker Sample 1 (<i>N</i> =195)	Teleworker Sample 2a (N=97)	Nonteleworker Sample 2b (<i>N</i> =947)
Precondition			
Nature of the work	13 (7%)	30 (31%)	154 (16%)
No need to be in the office	28 (14%)	15 (15%)	51 (5%)
Motive			
Avoid commute	68 (35%)	24 (25%)	340 (36%)
Financial	9 (5%)	15 (15%)	309 (33%)
Tend to family demands	49 (25%)	25 (26%)	239 (25%)
Productivity	44 (23%)	15 (15%)	232 (24%)
Personal preference	23 (12%)	19 (20%)	233 (25%)
After hours worka	36 (18%)	10 (10%)	147 (16%)
Tend to nonwork demands	42 (27%)	6 (6%)	130 (14%)
Personal illness or medical	24 (12%)	6 (6%)	100 (11%)
Inconvenient work hours ^a	6 (3%)	3 (3%)	33 (3%)
Environmental	0	3 (3%)	23 (2%)
Total Reasons	342	171	1991

Note. ^a Inconvenient work hours and after hours work imply that workers have some flexibility in the hours that they work (flextime); however, it is important to note that not all telework arrangements include temporal flexibility. Percentages reflect the percent of <u>people</u> in a given sample who mentioned that motive. Percentages within sample total more than 100% because many respondents listed more than one motive, and individual responses could be coded into more than one category



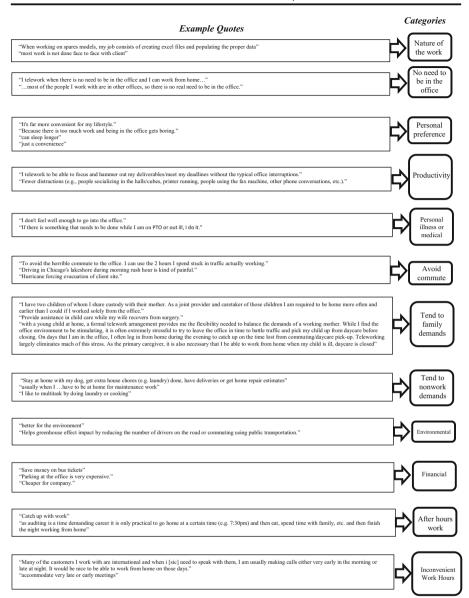


Fig. 1. Overview of the Data

own words. Although the three samples varied in the nature of work conducted, geography, reputation for family-friendly policies and telework status, the overall percentages of responses associated with each motive were quite similar. The biggest difference was a lack of environmentally-related motives mentioned in Sample 1.



Results

Sample 1 responses ranged from 1 to 60 words with a mean of 25.20 words (SD = 16.94 words, N = 195). In total, respondents provided 342 total motives to the question "Why do you telework?" On average, each employee reported slightly more than one motive (M = 1.14, SD = 1.16, median = 1.00, mode = 1, range = 1–5).

Sample 2a responses ranged from 1 to 76 words with a mean of 24.74 words (SD=15.39 words, N=97). They provided 171 total motives to the prompt asking participants to list *all* the reasons why they telework. As the prompt for Sample 2a encouraged employees to list multiple reasons, it is not surprising that the employees in this sample reported more motives per person than Sample 1 (M=1.98; SD=1.10; median = 2.00; mode = 2; range 1–6). In fact, many respondents numbered their reasons, indicating that employees possess (and are aware of) multiple motives for teleworking (RQ4).

Sample 2b responses ranged from 1 to 76 words with a mean of 24.74 words (SD = 15.39, N = 947) words. Similar to Sample 2a, nonteleworkers (Sample 2b) were encouraged to list multiple reasons. Correspondingly, they provided 1991 total motives. On average, nonteleworkers reported slightly more than two motives (M = 2.10, SD = 1.55, median = 2.00, mode = 2, range 1–8).

Consistent with previous research, employees listed a mixture of two preconditions as well as ten motives for teleworking. All of the motives for non-teleworkers could be organized into the same 12 categories (RQ 3) and contrary to expectation, nonteleworkers were not more likely than teleworkers to list preconditions as motives. Next, we describe the two preconditions that emerged in the responses, followed by ten motive categories in order of prevalence across the three sub-samples (RQ 2).

Preconditions

Nature of the Work (Tasks)

Many teleworkers and nonteleworkers focused on the *tasks* they conducted (e.g., "I am a software developer and I can code/build software from most PCs"). Some respondents noted they did not need to access resources at the main worksite (e.g., "The primary nature of my work is computer programming and requires no access to any special hardware or resources tied to my being physically present") or engage in face-to-face interactions (e.g., "some of my work can easily be done from home without needing the help of others face to face"). Thus the nature of the work could be completed without extensive resources or the help of others.

No Need to Be in the Office (Location)

Some respondents focused on the *location* in which work was conducted (e.g., "unnecessary to come into work on certain days") and that it was not necessary to be at the main worksite to get work done (e.g., "work to be done doesn't require being in the office"). Whereas this category is similar to the nature of the work category, we noted that not all responses mentioned tasks and location, so we felt



it important to acknowledge which of the two was emphasized in their response. In fact, forced telework during the pandemic indirectly teased tasks and location apart such that those who could find a way to do their tasks from home (e.g., teach Kindergarten) were strongly advised to work from home, whereas those who do location-specific work (e.g., tending to patients in a hospital) were not able to do so. Some responses were coded in both categories (e.g., "most of my work can be done remotely. Prepping data, and emailing is a major part of my daily workload, it is not necessary for me to do this on site.").

Telework Motives

Avoid Commute

The most frequently cited motive for teleworking was to reduce the amount of time spent commuting (e.g., "eliminate travel time to and from work"), as well as various adversities associated with commuting including bad weather (e.g., "during inclement weather due to ice/snow storms") and traffic delays (e.g., "this would cut down on my stress of sitting in traffic in the afternoons"). As one employee explained, the "daily commute to office is 45min-2hrs each way, depending on traffic." Another described the perils of driving in winter: "snowed in; bad road conditions - too cold to drive (-20 degrees, F)." Some employees specified how they would reallocate this time (e.g., "Also, I utilize the time commuting to do work hence it allows me to have more time to do other things whether it means additional work or tend to personal needs"), which may also hint at other motives (e.g., productivity or business continuity), whereas, others simply stated that they telework so they "don't have to waste time commuting."

Financial

The second most frequently cited motive was a desire to reduce costs or save money for the employee or the organization. Although most expenses were a function of commuting (e.g., "save on gasoline costs," "save money on bus tickets," "parking at the office is very expensive"), many respondents explicitly mentioned expenses as an additional motive (e.g., "To reduce commute time and expense (gas and wear & tear)" or without mentioning the commute (e.g., "Keep home budget costs down due to high gas prices"). In addition to commute-related expenses, a few other expenses were also mentioned (e.g., "home with dogs so I don't have to pay a dog walker on the days I telework" and "It enabled me to move farther away from work in order to purchase a home rather than rent"). As noted earlier, some respondents identified savings for the company (e.g., "Telework could save money for the comany [sic] as well (reduction of energy and facilities usage)," but the majority of the responses coded in this category concerned personal expenses (13/15 for Sample 2a and 288/309 for Sample 2b).



Tend to Family Demands

The third most frequently cited motive for telework was the need to tend to family demands. Some responses were broad like "family commitments," "work-life balance," and "Teleworking gives me more time with my family." Other responses were quite specific and often concerned childcare, "I have 2 kids and it would help when they're sick and/or the babysitter is unavailable." Many respondents mentioned young children (e.g., "My wife and I recently had a baby and I'm trying my best to balance my work life with interaction with my new child" and acute illnesses (e.g., "I have a young child who gets sick on occasion"), but others mentioned more chronic diseases (e.g., "1. Have two teens at home-my voungest has ADHD/ODD and depression—I need to be home to make sure he has someone there for him after school." Some family-related responses concerned transportation issues interfering with the ability to attend children's activities, (e.g., "home earlier for kids events that I need to be at" and "I have children so teleworking would allow me to spend more time with them and attending their events and school functions"). Some respondents identified other dependents to care for (e.g., "Wife was in hospice care with me being the primary caregiver" and "Moved to Florida because of my husband's health issues.").

Productivity

The fourth most frequently cited motive concerned efforts to be productive and avoid the traditional work environment when it was not conducive to work. Multiple respondents reported it was more expedient to telework due to distractions and interruptions at the main work site. One employee explained that he teleworks because he "can concentrate removed from the social distractions, politics and difficult, crowded facility." Another stated that telework "allowed me to specifically focus on some projects. It's difficult to get uninterrupted time in the office due to the cubicles and facility constraints. The environment is really distracting. There is no privacy for any phone calls pertaining to work." Others stated "I can get more done without people bothering me at work!" as well as "[I] sometimes have to work on tasks that require concentrated focus and there are less distractions [at home]."

Personal Preference

The fifth most frequently cited motive was a range of issues that could be grouped together under the broader category of personal preference. Consistent with popular press (Healy, 2013), some respondents mentioned the ability to spend less time getting ready and to wear less formal and more comfortable clothing (e.g., "I save the hour it takes to 'get dressed up' by working in jeans, a t-shirt and a pony tail"), as well as working in a more relaxed and comfortable environment ("e.g., [I] could customize my environment [sic] (set the AC to my liking, play music if I want to, wear casual clothes, etc"). Many described a more desirable environment at home (e.g., "It would spark creativity by being able to work in a different environment, especially one with windows."). One teleworker indicated that telework "fits [their] work style;" while a nonteleworker projected that telework "Allow [s] better performance because I am able



to work when I am at best"). Many respondents simply indicated that telework is "convenient" without extensive elaboration.

After Hours Work

Although researchers define telework as working in a different location during typical work hours and "substituting time typically spent in the central office... rather than working additional overtime hours" (e.g., Allen et al., 2015, p. 44; Golden, 2012) and we defined telework on the surveys for the respondents, many teleworkers reported conducting work at home after traditional work hours. Frequently, this was because they could not complete all of their work in the traditional 40-h work week (e.g., "finishing work after hours," "Required to keep up with work load," "I am dedicated to my job, and usually my day does not end at 5pm," and "I usually just telework at night if I have something I have to get done"), and because they would rather work at home than continue to work at the main work site (e.g., "for very late nights when I would be in the office later than 10:00 and choose to walk home and work from there [home] rather than walking home later"). Some employees would work after hours to make up for missing some work time during traditional work hours (e.g., Sometimes in the evenings or to make up time taken during the day for various appointments or children engagements"). Many nonteleworkers expressed a willingness to work additional hours in the evening (e.g., "after I put the kids to bed I could continue drawing the schematics, or writing the paper or reviewing the drawings, etc."). For some employees working at this alternative time was more efficient (e.g., "Sometimes it is easier to work from home when the server is less busy to upload documents to the eroom").

Many of the nonteleworkers expressed frustration over not being permitted to telework during traditional work hours or count overtime work completed at home toward their billable hours because they were not formally designated by the company as "teleworkers." For many employees, working from home is teleworking, regardless of when it occurs. That said, consistent with other researchers (e.g. Golden, 2012), it is important to differentiate teleworking during traditional work hours and teleworking after hours.

Tend to Nonwork Demands

In addition to tending to family-related demands, many respondents identified the need to take care of other nonwork demands as a reason for teleworking or wanting to telework. This category included being home for home-related maintenance (e.g., "House maintenance visits when I prefer to be at home while someone is in my place, etc." and deliveries (e.g., duties that require me to be home. Signature required deliveries, service request for the home"). It also concerned conducting nonwork tasks during the work day (e.g., "Plus can cook dinner and do laundry at lunch"), as well as immediately afterwards (e.g., "run errands close to home").



Personal Illness or Medical

In addition to dependent medical care, many individuals reported a need to tend to their own medical needs including routine preventative care. This category included descriptions of brief illnesses (e.g., "I can work when I am sick and feel too bad to put on a good work image" and "work while sick since I am just sitting at home (trying not to infect others)," and doctor's appointments. A handful of employees reported the need for short-term accommodations for a personal medical condition (e.g., "I had knee surgery and am not mobile enough to drive or walk very well), as well as long-term accommodations (e.g., "I have fibromyalgia and cannot predict from one day to the next what I may be feeling like. The arrangement has allowed me the flexibility that I need to have to deal with this condition"). For some, teleworking facilitated getting back to work sooner following a medical procedure (e.g., "What started as a plan to bring me back gradually from surgery evolved into a very successful work arrangement") and retaining a job and health insurance which is critical for employees facing chronic illness.

Inconvenient Work Hours

Another reasonably prevalent telework motive that emerged was accommodating inconvenient work hours. This category is different from the additional work hours category as it often concerned work that was consistent with the employees' job description but clearly had to be conducted at nontraditional times (e.g., "My dept. is a 24/7 environment where we have decided to have each worker share on-call duties"). This includes conference calls with clients in other time zones (e.g., "Typically to take early or late conference calls with India"), information-technology-related work ("e.g., "Perform computer support tasks which requires other users to not be working), as well as meeting deadlines at atypical times (e.g., "to support customer deadlines that fall outside of regular business hours").

Environmental

The least frequently mentioned telework motive was a desire to reduce emissions and their negative impact on the environment (e.g., "is environmentally friendly"). Because some respondents identified this specific reason independent from avoiding the commute (e.g., "less pollution and congestion on the roadway") and most commute-related responses did not mention the environment, we kept this category separate.

Covariance with Other Teleworker Characteristics

To explore the extent to which telework motive categories vary systematically with one another, demographic characteristics, and other telework variables, we conducted a series of correlations. It is important to note that these correlations are point bi-serial correlations as motives were coded simply as present or not. We report all of the correlations that were statistically significant at the p < .05 level.

For Sample 1 (n = 187-195), telework motives correlated with one another and the strongest correlation was between the nature of the work and not necessary to be in the



office (r=.48). Women were more likely to report teleworking to tend to family demands (r=-.30) and for personal medical reasons (r=-.14). Younger workers were significantly more likely to report the motive that there was no need to be in the office as a reason to telework (r=-.19). Married individuals were more likely to report teleworking because they needed to tend to family demands (r=.34). Employees with children in the home were significantly more likely to report motives for tending to family demands (r=.43) and less likely to report motives for tending to nonwork demands (r=-.15). Employees who telework more frequently were significantly less likely to report motives to tend to nonwork demands (r=-.16) and after hours work (r=-.19). Employees who reported higher levels of telework satisfaction were more likely to report teleworking to avoid the commute (r=.16), to tend to family (r=.26) and nonwork demands (r=.16), to have more telework motives in general (r=-.16), and less likely to telework because of inconvenient work hours (r=-.19).

For Sample 2a (n=83–97), which was the smallest and perhaps least statistically stable sample, the strongest intercorrelation among the motives was a negative relationship between a telework motive to tend to family demands and the precondition that work was conducive to it (nature of work; r=-.34). In this sample, sex was not significantly related to any of the motives. Older workers were significantly more likely to report productivity-related motives (r=.22). Married individuals were less likely to report teleworking because of inconvenient work hours (r=-.33). Employees with children were significantly less likely to report financial reasons for teleworking (r=-.28). Employees who teleworked more frequently were less likely to report motives concerning inconvenient work hours (r=-.23) and after hours work (r=-.23) and more likely to report a personal preference to telework (r=.24).

For the nonteleworker sample (2b; n=801–947), the strongest intercorrelation among the motives was between the desire to avoid the commute and financial reasons (r=.38). In this sample, women were more likely to report motives concerning tending to nonwork demands (r=-.11). Older workers were significantly more likely to want to telework to tend to family demands (r=.20), inconvenient work hours (r=.10), and for financial reasons (r=.08) and less likely to report a desire to telework to tend to nonwork demands (r=-.08). Married workers were significantly more likely to report wanting to telework to tend to family demands (r=.26) and inconvenient work hours (r=.08) and were less likely to want to telework because their work was conducive to it (r=-.08). Employees with children were significantly more likely to report wanting to telework in order to tend to family demands (r=.33) and less likely to report wanting to telework for personal illness or medical reasons (r=-.08).

As a supplement to these analyses, we also conducted some exploratory analyses in which we correlated the sum of motives presented as well as the presence or absence of each motive category with personality (e.g., work-nonwork segmentation, work ethic) and outcome (e.g., job satisfaction) variables. These correlations are presented in the Appendix but not interpreted in the text as they were purely exploratory and are not consistent across the samples.



Discussion

Motives for teleworking are important to identify as they contextualize teleworking behavior, represent proximal telework outcomes, and serve as potential boundary conditions for telework-outcome relationships. Previous reviews of the telework literature concluded employees' motivations for teleworking were unclear (Bailey & Kurland, 2002) and called for research explicitly considering the reasons for teleworking (Allen et al., 2015). Although various motives for telework have been reported (Mokhtarian & Salomon, 1997; Stephens & Szajna, 1998), various limitations have inhibited comparisons across the studies preventing research on this topic from advancing. Further, a comprehensive parsimonious taxonomy of motives to telework had not been previously put forth. After summarizing the research literature to date and gathering qualitative data from two independent samples, we differentiate two telework preconditions from 10 categories of telework motives and provide prevalence of these motives within two independent samples of employees.

Prevalence of Telework Motives

Our first research question asked what are the motive categories that emerge, how prevalent are the motives, and if the taxonomy applies equally to teleworkers and nonteleworkers. The most prevalent motive reported across all three subsamples was avoiding the commute (25–36% of each sample), especially for non-teleworkers. This finding directly contradicts Bailey and Kurland's (2002) conclusion that empirical research did not support travel reduction as a primary telework motive the need to "reconsider why people telework" (p. 383).

Consistent with Shockley and Allen's (2012) findings that employees are motivated to telework for work-related reasons, many teleworkers seek environments that promote productivity and reported escaping from environments that were not conducive to work in order to avoid distractions, interruptions, and coworkers. Many also indicated they were more productive working in an alternative location. Several employees preferred the quiet space, comfortable environment, and the potential to work more hours in a convenient location. Interestingly, research showing that telework is associated with significant improvements in productivity is lacking (Allen et al., 2015), possibly due to comparisons between people who choose to telework vs. those who do not. The findings from the current study indicate that at least some teleworkers report being equally if not more productive at home.

Work-related reasons did not dominate over nonwork-related reasons in our data. Tending to family demands was reported by 25–26% of the respondents in each sample and additional nonwork demands were reported by 6–27% of each sample. It is clear there are a multitude of reasons for teleworking and gathering data beyond general work and nonwork reveals how much richer these motives can be.

Perhaps some of the most interesting findings were the inconvenient work hours and after hours work motives, which implied a synergy with flextime in which employees had at least some autonomy over when they worked. Although researchers have noted teleworkers are motivated by flexibility in time (Hilbrecht et al., 2008), a strict definition of telework involves only altering physical (not temporal) boundaries. However, when employees are given discretion over both physical and temporal



boundaries, they have considerably more autonomy to tend to nonwork demands as needed. Correspondingly, we feel it is important to point out that many employees appear to be able to (or expect to) pair telework with flextime and that the combination of altered physical and temporal boundaries may result in synergistic outcomes (Dilmaghani, 2020; Thompson et al., 2015). In contrast, simply teleworking without the ability to alter work times is not likely to be as attractive and result in as many benefits as the combination of the two. Further, employers should clearly articulate policies to employees, as a misguided assumption that a telework policy includes flextime could result in negative outcomes.

As indicated in our data, it is important to acknowledge that not everyone is motivated to telework (even when they can) or perceives the home as the preferred work location. As Kreiner (2006) identified, many individuals prefer to segment their work and nonwork roles, attempting to keep "work at work" rather than integrating the two domains. Consistent with this, Shockley and Allen et al. (2015) found that a preference to segment work and family was negatively related to work-related motives to telework. We asked employees why they telework or would want to telework; however, it might be equally interesting to ask employees with the opportunity to telework why they choose to not telework (e.g., Koh et al., 2013), in order to determine how reasons not to telework compare to reasons to telework (e.g., Belanger, 1999). A number of telework challenges have been identified in the literature that should be included in those lists (e.g., Greer & Payne, 2014). In addition, employees forced to telework (e.g., weather-related office closures) are likely to differ in their experiences and challenges.

In addition to the 10 motives identified, another theme that emerged concerned a remote work arrangement, which can also be construed as a full-time telework arrangement. Some of these teleworkers indicated that they "teleworked" full-time due to a lack of a corporate presence where they lived (e.g., "no formal office space available at the [company name] office closest to my home") or to retain employment with the organization. These arrangements describe a circumstance where the organization was accommodating the employee's nonwork demands and/or desire to live in a location where the daily commute to the central worksite is beyond practical (i.e., 2 h one way) or sometimes even impossible (e.g., "My husband's job moved us from NY to MA, and my employer wanted me to stay in my position, so they provided me with the opportunity to telework full time. I return to the office once a month for a day or two" and "moved to Florida because of my husband's health issues." Although some of these arrangements involved family demands, not all of them mentioned family (e.g., "Work with National relations. No interaction with local office").

Multiple Motives

Our fourth research question concerned whether teleworkers have multiple motives for teleworking. Previous research examining telework has not always considered the possibility that employees may have multiple motives for teleworking. Many teleworkers reported more than one reason for teleworking. When instructed to provide *all the reasons*, employees provided an average of two reasons. Correspondingly, we recommend any future telework motive research should permit employees to identify more than one. Likewise, when employees request to telework, managers are likely to ask why. Our data indicate that managers should not assume that employees have only one reason or motive for



their request. Because, family-related attributions have been associated with career penalties (Leslie et al., 2012), it is important to educate managers about the widerange of telework motives as assumptions and biases about the reasons why employees request to telework could have adverse consequences for the employee.

Motive Category Relationships

Our final research question concerned the interrelationships among the motive categories as well as relationships with demographic characteristics. Across all three samples, the motives were interrelated but the correlations among them did not imply redundancy. Relationships with demographic characteristics were not consistent across the three samples, but many significant relationships emerged. Employees who teleworked more frequently were significantly more likely to report the motive of working after hours. Perhaps the most noteworthy correlations indicate that women, married employees, and employees with children were significantly more likely to report teleworking to tend to family demands and to want to telework for this reason. Contrary to Shockley and Allen's (2012) sample of faculty members, we found some evidence that traditional gender roles still motivate work behaviors for some employees.

Theoretical Implications

The current study presents a relatively comprehensive taxonomy for organizing telework motives using data from heterogeneous samples of teleworkers and nonteleworkers. Although previous taxonomies of categories have been suggested (e.g., push and pull, Bailey & Kurland, 2002; work and life-management, Shockley & Allen, 2012) and there are some parallels between them (e.g., work demands tend to push one out of the main worksite), these taxonomies are arguably too parsimonious. Our study expands the landscape around the underlying drivers for seeking these alternative work arrangements. Also, the inconsistent relationships with demographic variables reveals that such characteristics are not suitable proxies for motives. Previous research has shown that managers are less likely to honor requests for flexible scheduling from women compared to men (Brescoll et al., 2013). It is not clear if a similar bias occurs concerning telework.

Reducing the commute is consistent with the need to economize resources and reduce uncertainties. The idea that employees seek ways to minimize the expenditure of resources is consistent with Hobfoll's (1989) Conservation of Resource Theory and the uncertainty-reduction hypothesis (Hogg & Terry, 2000). Whereas many telework motive studies have identified reducing the commute, not all studies acknowledge that commutes involve temporal, economic, and even psychological costs. How these resources are reallocated is likely to vary, indicating the real underlying motive. Relatedly, commutes are often unpredictable and can therefore lead to unexpected resource loss (e.g., time loss, frustration, costs associated with car accidents or sharing public spaces with other commuters). Resource loss spirals occur when individuals do not possess sufficient resources to offset losses (Hobfoll, 1989). When unexpected disturbances in (often already difficult) commutes occur, employees may face potential loss spirals that can impact their work and/or family domains. The uncertainties



associated with the daily commute to and from the work site may be reduced by teleworking.

In theory, employees who telework to avoid interruptions are seeking proximal work-related outcomes (e.g., meeting deadlines) and should correspondingly have more favorable distal work-related outcomes (e.g., higher productivity) than if they were to stay in the office. Likewise, employees who telework to facilitate and monitor home repairs are seeking proximal nonwork-related outcomes (e.g., completion of home repairs) and should correspondingly have more favorable distal nonwork-related outcomes (e.g., reduction in stress over nonwork demands). However, we cannot assume that needs corresponding to these motives are fulfilled. Instead, the extent to which teleworking results in fulfilled needs is an empirical question that warrants additional data and testing. We encourage researchers to test these ideas using our taxonomy and to measure the intensity of each motive as well as expand on the telework motivation nomological net by also contrasting it to motivation to work.

Practical Implications

Expanding our knowledge of telework motives also has many policy-related implications. Including: (a) whether or not to implement a telework policy, (b) the design of the policy (e.g., should it also include flextime), (c) predicting and planning who will use the policy, (d) granting employees permission to telework, and (e) measuring the effectiveness of the policy. Further, insights from more science on telework motivation could promote and enhance successful telework arrangements.

Practically, our taxonomy facilitates the measurement of telework motives as well the measurement of coworkers' and supervisor's attributions about request and use of telework arrangements. Managers may want to present the list of motives we identified to employees seeking to telework so that there is a shared understanding about what the employees hope to gain. This can facilitate decisions about the arrangement like the frequency, the need to incorporate flextime, the scheduling of events that require a physical appearance, ability to meet client demands, and the allocation of technological resources to facilitate the process. Discussions about motives may also reduce supervisor misattributions, which have been associated with performance ratings and employee career success (Leslie et al., 2012). At the same time, we caution managers and policy-makers against extending the opportunity to telework based on specific employee motives as this creates a value judgment that could result in inequity issues (Kelly & Kaley, 2006). Decisions to allow telework should be motive-neutral; instead a conversation regarding motives should happen independent of opportunity so that bias does not creep into these decisions. Further, motives vary within individuals over time due to changes in circumstances, life events, or environmental factors. Therefore, we recommend continued conversations between employees and their managers regarding benefits and barriers surrounding work location.

Managers can also use this list of motives to explore alternatives to teleworking when it is not feasible. For example, employees who seek uninterrupted work time can be given permission to block out times on their work calendar or use unoccupied workspace to avoid distractions at the work site. Likewise, companies can consider organizing ride-share programs or subsidize public transportation costs. Further, if telework is not a possibility, flextime may be a consideration. Employees who have



the ability to control their work schedule around nonwork demands may experience the same outcomes as teleworkers. Additionally, whereas flextime cannot eliminate a long commute, the ability to avoid rush-hour traffic may enable employees to meaningfully reduce commute times thereby conserving valued resources.

Although other forms of flexible work arrangements can facilitate employee retention during an illness (e.g., sabbaticals, reduced workload), telework can be a useful solution for many employees to maintain employment and benefits (e.g., healthcare). Many employees working in the US have the ability to take off work for short-term illness (e.g., the flu); however, policies such as the Family and Medical Leave Act do not provide all employees a way to maintain their jobs and income throughout the course of a long-term illness or global pandemic. Managing physical and temporal demands associated with ongoing illnesses (e.g., dialysis appointments for kidney disease) may make working at the central worksite overwhelming. Similarly, employees may prefer to avoid exposure to coworkers or clients who do not follow recommendations/guidelines for safe social interactions. The Americans with Disabilities Act requires employers to provide "reasonable accommodations" which may include flexible work arrangements like telework (Kossek et al., 2014). Unfortunately, telework policies prompted in this manner may not be designed with the same facilitators (e.g., organizational support) as telework arrangements initiated by organizations to promote business outcomes or support employee well-being.

The COVID-19 pandemic has challenged previous assumptions regarding what kinds of work that can be done remotely (e.g., K-12 teaching). In other words, due to more technology-mediated communication platforms, the number of jobs that meet the preconditions to telework has likely changed. Correspondingly, many organizations are embracing telework. This is an important shift in how organizations attract and retain employees, which broadens the pool of qualified candidates significantly. Candidates are also witnessing this shift and those seeking remote work could be more attracted to organizations who allow remote working versus organizations who require office presence, making this an important distinction for attracting candidates. Zillow, for example, is offering 90% of their employees the ability to work from home permanently (Spaulding, 2020), making it an attractive organization for those preferring or requiring remote work due to any of the motives outlined in this study.

There are also financial implications of this shift to more remote working. Organizations are able to reduce office space requirements and therefore lower costs associated with real estate, energy heating and cooling offices, copies and other office supplies. Historically, most employees have been required to live near their place of employment, sometimes foregoing geographic proximity to family to advance their careers. Similarly, some specialized jobs have historically required working in a metropolitan area with a high cost of living. Organizations broadening their conceptualization of motives to telework has the propensity to shift this requirement, allowing for more innovative ways of getting work done.

Future Research Directions

Our list of 10 telework motives can inform future telework motivation research in various ways. First, telework researchers may want to use the 10 motives we identified to inform the questions they ask and gather more quantitative data by asking employees



to prioritize the motives. Motives may serve as meaningful moderators when looking at the relationship between telework and relevant corresponding outcomes (e.g., commute satisfaction or work-family conflict). Motives rated more strongly may be associated with various outcomes including frequency, quality, satisfaction with, and effectiveness of telework. They may also vary over an individual's lifespan or even on a day-to-day basis. Telework researchers should also explore the extent to which motives influence nonteleworking coworkers' reactions (e.g., perceived fairness of the opportunity, perceived organizational support, organizational commitment).

Second, it would also be informative to test the extent to which these 10 motives apply to motives for other alternative work arrangements including flextime, compressed workweeks, and flexible shift work. Flextime is frequently touted for enabling employees to meet nonwork demands (e.g., leave work to attend a child's karate lesson). However, employees may also choose to arrive at the office early for work-related reasons (e.g., avoid traffic, better parking, quiet office environment). Understanding both the unique and common motives for utilizing flexible work arrangements can help researchers and practitioners design and implement mutually beneficial policies and practices.

Third, our list of telework motives also indirectly reveals a number of ways to assess the effectiveness of telework policies. For example, teleworkers who work from home to avoid a long commute are likely to focus on the reduction of money spent on gas, parking, or public transportation fees; reduced miles and wear and tear on the car; and time reallocated that would otherwise be spent on commuting. Time and money savings would be particularly meaningful ways to assess the effectiveness of teleworking for these employees. In contrast, teleworkers who work from home to care for an injured loved one who is recuperating from surgery are likely to focus on the number of times they have been available to help the loved one with their needs, the value and quality of those interactions, and his/her recuperation time versus setbacks. It would also be theoretically interesting to see how telework motives relate to work- and family-centered identities and the reduction of uncertainty. Do work-centered identities relate to work-related motives which in turn result in higher rates of productivity?

Fourth, the comparison group for assessing the effectiveness or productivity of teleworkers is often nonteleworkers or office-based workers. However, the results of the current study suggest individuals differ in their desire to work away from the primary work site. Several nonteleworkers cited enhanced productivity via fewer distractions and a quieter work environment as a motive to telework. Assessing productivity of teleworkers compared to their productivity when required to conduct all of their work at the primary work site (using a within-subjects study design) is likely to be a more appropriate assessment of the benefits of telework. It may also be practically meaningful to compare among employees with strong motives to telework, those who are permitted to telework vs. those who are not. As more companies are embracing this option, employees may leave employers who do not permit it (Melin & Egkolfpoulou, 2021).

It is important to note although not empirically tested here, the taxonomy appears to capture all of the reasons for teleworking during the COVID-19 pandemic, even though teleworking was much less discretionary. We speculate that the primary pandemic-specific reasons for telework are (1) personal medical to avoid exposure and spreading of the virus (CNN, 2020), (2) financial to maintain business continuity (Perrett, 2020),



and (3) to tend to family demands as many K-12 schools provided online education or some hybrid, thus many children needed supervision at home (Foster, 2020). Clearly, the prevalence of these motives is substantially greater than what was conveyed in our samples gathered before the pandemic. Future research will reveal the extent to which the taxonomy remains comprehensive over time.

In summary, this research reveals 10 distinct telework motives, which is likely to be useful information to organizations contemplating offering this work arrangement to their employees as well as organizations that are currently managing teleworkers. This taxonomy may also be helpful to work-family researchers as it consolidates the previously fragmented literature on motives for taking advantage of alternative work arrangements. By understanding why individuals telework or want to telework, organizations are better able to enhance teleworking arrangements and in turn, teleworker job satisfaction. Organizations hoping to implement successful telework programs should be aware of the reasons why employees utilize the arrangement in order to maximize the potential for fulfilling those motives and to maintain a productive and healthy workforce.

Appendix

Correlations between Telework Preconditions and Motives and Personality and Outcome Variables

Note that correlations with the preconditions and motives are point bi-serial correlations as motives were coded simply as present or not based on what respondents wrote in response to an open-ended question. Correlations with Sum of motives are Pearson correlations. We report all of the correlations that were statistically significant at the p < .05 level (i.e., blank cells reflect correlations that did not meet the threshold for statistical significance). Details on the measures used for the other variables are available from the second author. Due to some missing data, sample sizes ranged from 187 to 195 for Sample 1, 83–97 for Sample 2a, and 801–947 for Sample 2b. Close to 150 people did not report marital status and children for Sample 2.

Power analyses ($\alpha = .05$ and $1-\beta = .80$) indicate that a sample size of 614 is needed for an effect size of .1, 150 for an effect size of .2, and 64 for an effect size of .3. Sample 1 (teleworkers)

	Precondi	Mot	ives								
Nature	No need	Avoid	Fin	Fam	Prod	Pref	After hrs	Nonwork	Med	Incon hrs	Sum
Seg	16										
AC											.15
Job sat					.17	23					.18
WFC				16							15
FWC											
TOI						.17					15



Sample 2a (teleworkers)

	Precondi	Preconditions Motives									
Nature	No need	Avoid	Fin	Fam	Prod	Pref	After hrs	Nonwork	Med	Incon hrs	Sum
Seg											.22
Hadwork				35							
Centrality											
Waste time			22	35							
Job sat											
WFC									27		
FWC							.26		-2.6		
TOI			.23								

Sample 2b (nonteleworkers)

	Precondi	tions	Mot	ives								
Nature	No need	Avoid	Fin	Fam	Prod	Pref	After hrs	Nonwork	Med	Incon hrs	Env	Sum
Seg						.08						
Hadwork											.09	
Centrality	.07							.11			.09	.09
Waste time		.07		.08		.09					.07	.12
Job sat			08					.08				.11
WFC			.08		.07							
FWC					.16							.07
TOI	.13											.07

Note. Seg = work/nonwork segmentation preference, Hard work = hard dimension of work ethic scale, Centrality = Centrality dimension of work ethic scale, Waste time = waste time dimension of work ethic scale, Telesat = telework satisfaction, AC = affective commitment, Job sat = job satisfaction, WFC = work-family conflict, FWC = family-work conflict, TOI = turnover intentions. Telework motive categories appear across the top: Nature = nature of work, Avoid = avoid the commute, Fin = financial, Fam = tend to family demands, Prod = productivity, Pref = personal preference, After hrs = after hours, Nonwork = tend to nonwork demands, Med = personal medical, Incon hrs = inconvenient hours, Sum = sum of motives listed. Environmental reasons were not listed by any Sample 1 -participants. Protestant Work Ethic was not measured in Sample 1. Affective commitment and telework satisfaction was not measured in Sample 2

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Declarations

Ethics Approval (Includes Appropriate Approvals or Waivers) Not Applicable.

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References

- Allen, T. D., Golden, T. D., & Shockley, K. M. (2015). How effective is telecommuting? Assessing the status of our scientific findings. *Psychological Science in the Public Interest*, 16(2), 40–68. https://doi.org/10. 1177/1529100615593273.
- Ashkanasy, N. M., Ayoko, O. B., & Jehn, K. A. (2014). Understanding the physical environment of work and employee behavior: An affective events perspective. *Journal of Organizational Behavior*, *35*, 1169–1184. https://doi.org/10.1002/job.1973.
- Bailey, D. E., & Kurland, N. B. (2002). A review of telework research: Findings, new directions, and lessons for the study of modern work. *Journal of Organizational Behavior*, 23, 383–400. https://doi.org/10.1002/ job.144.
- Bouziri, H., Smith, D. R., Descatha, A., Dab, W., & Jean, K. (2020). Working from home in the time of COVID-19: How to best preserve occupational health? *Occupational and environmental medicine*, 77(7), 509–510. https://doi.org/10.1136/oemed-2020-106599.
- Belanger, F. (1999). Workers' propensity to telecommute: An empirical study. *Information & Management*, 35, 139–153.
- Brescoll, T., Glass, J., & Sedlovskaya, A. (2013). Ask and ye shall receive? Employer provided flexible work options and the need for public policy. *Journal of Social Issues*, 69, 367–388.
- Bureau of Labor Statistics. (2013). News release: American time use survey 2012 results. Retrieved from http://www.bls.gov/news.release/pdf/atus.pdf.
- Burke, P., & Reitzes, D. (1991). An identity theory approach to commitment. Social Psychology Quarterly, 54, 239–251.
- Burke, P. J., & Tully, J. C. (1977). The measurement of role identity. Social Forces, 55(4), 881-897.
- CNN. (2020). The world's biggest work-from-home experiment has been triggered by coronavirus. https://www.cnn.com/2020/02/14/asia/coronavirus-work-from-home-intl-hnk-scli/index.html
- Dilmaghani, M. (2020). There is a time and a place for work: Comparative evaluation of flexible work arrangements in Canada. *International Journal of Manpower*. https://doi.org/10.1108/IJM-12-2019-0555.
- Evans, G. W., & Wener, R. E. (2006). Rail commuting during and passenger stress. *Health Psychology*, 25, 408–412. https://doi.org/10.1037/0278-6133.25.3.408.
- Fleming, A. R., Phillips, B. N., Kaseroff, A., & Huck, G. E. (2014). A qualitative study of job placement provider decisions in vocational rehabilitation. *Rehabilitation Counseling Bulletin*, 58(1), 7–19.
- Foster, B. L. (2020). How to master working from home while under quarantine with the kids. https://www.parents.com/parenting/work/life-balance/how-to-master-being-a-work-at-home-mom/#:~:text=How% 20to%20Master%20Working%20From%20Home%E2%80%94While%20Under%20Quarantine,productive%20while%20working%20from%20home.%20Whether%20your%20.
- Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology*, 92, 1524–1541. https://doi.org/10.1037/0021-9010.92.6.1524.
- Glass, J. L. (2004). Blessing or curse: Work-family policies and mother's wage growth over time. Work Occupations, 31, 367–394.
- Global Workplace Analytics (2017). 2017 State of Telecommuting in the U.S. Employee Workforce.



- Golden, T. D. (2012). Altering the effects of work and family conflict on exhaustion: Telework during traditional and nontraditional work hours. *Journal of Business and Psychology*, 27, 255–269. https://doi. org/10.1007/s10869-011-9247-0.
- Golden, T. D., Veiga, J. F., & Simsek, Z. (2006). Telecommuting's differential impact on work-family conflict: Is there no place like home? *Journal of Applied Psychology*, 91(6), 1340–1350. https://doi.org/ 10.1037/0021-9010.91.6.1340.
- Greer, T. W., & Payne, S. C. (2014). Overcoming telework challenges: Outcomes of successful telework strategies. The Psychologist Manager Journal, 17, 87–111. https://doi.org/10.1037/mgr0000014.
- Harris, R. J., & Firestone, J. M. (1998). Changes in predictors of gender role ideologies among women: A multivariate analysis. Sex Roles, 38, 239–252. https://doi.org/10.1023/A:1018785100469.
- Healy, R. (2013). The 10 real reasons you like working from home. U.S. news & world report. Retrieved from: https://money.usnews.com/money/blogs/outside-voices-careers/2013/05/30/the-10-real-reasons-you-like-working-from-home
- Hilbrecht, M., Shaw, S. M., Johnson, L. C., & Andrey, J. (2008). 'I'm home for the kids': Contradictory implications for work–life balance of teleworking mothers. *Gender, Work and Organization*, 15(5), 454–476.
- Hill, C. E. (2012). Introduction to consensual qualitative research. In C. E. Hill (Ed.), Consensual qualitative research: A practical resource for investigating social science phenomena (pp. 3–20). American Psychological Association.
- Hjorthol, R. J. (2006). Teleworking in some Norwegian urban areas. Urban Geography, 27, 610–627. https://doi.org/10.2747/0272-3638.27.7.610.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. American Psychologist, 44, 513–524.
- Hogg, & Terry, D. J. (2000). Social identity and self-categorization processes in organizational contexts. Academy of Management Review, 25, 121–140.
- Kelly, E. L., & Kalev, A. (2006). Managing flexible work arrangements in US organizations: Formalized discretion or 'a right to ask. Socio-Economic Review, 4, 379–416 1039/ser/mwl001.
- Koh, C. K., Allen, T. D., & Zafar, N. (2013). Dissecting reasons for not telecommuting: Are nonusers a homogenous group? The Psychologist-Manager Journal, 16, 243–260. https://doi.org/10.1037/ mgr0000008.
- Kossek, E. E., Hammer, L. B., Thompson, R. J., & Burke, L. B. (2014). Leveraging workplace flexibility for engagement and productivity. Society of Human Resource Management Foundation, 9–15.
- Kossek, E. E., Ruderman, M. N., Braddy, P. W., & Hannum, K. M. (2012). Work–nonwork boundary management profiles: A person-centered approach. *Journal of Vocational Behavior*, 81(1), 112–128. https://doi.org/10.1016/j.jvb.2012.04.003.
- Kreiner, G. E. (2006). Consequences of work-home segmentation or integration: A person-environment fit perspective. *Journal of Organizational Behavior*, 27, 485–507. https://doi.org/10.1002/job.386.
- Leslie, L. M., Manchester, C. F., Park, T. Y., & Mehng, S. A. (2012). Flexible work practices: A source of career premiums or penalties? Academy of Management Journal, 55(6), 1407–1428.
- Matos, K., Galinsky, E., & Bond (2016). 2016 National Study of employers. Families and Work Institute.
- Melin, A., & Egkolfpoulou, M. (2021, June 1). Employees are quitting instead of giving up working from home. https://www.bloomberg.com/news/articles/2021-06-01/return-to-office-employees-are-quittinginstead-of-giving-up-work-from-home
- Mitchell, T. R., & Daniels, D. (2003). Motivation. In W. C. Borman, D. R. Ilgen, & R. Klimoski (Eds.), Handbook of psychology: Industrial and organizational psychology (Vol. 12, pp. 225–254). John Wiley & Sons Inc.. https://doi.org/10.1002/0471264385.wei1210.
- Mokhtarian, P. L., Bagley, M. N., & Salomon, I. (1998). The impact of gender, occupation, and presence of children on telecommuting motivations and constraints. *Journal of the American Society for Information Science*, 49, 1115–1134.
- Mokhtarian, P. L., & Salomon, I. (1994). Modeling the choice of telecommuting: Setting the context. *Environment and Planning*, 26, 749–766.
- Mokhtarian, P. L., & Salomon, I. (1997). Modeling the desire to telecommute: The importance of attitudinal factors in behavior models. *Transportation Research Part A: Policy and Practice*, 31, 35–50.
- Morganson, V. J., Major, D. A., Oborn, K. L., Verive, J. M., & Heelan, M. P. (2010). Comparing telework locations and traditional work arrangements: Differences in work-life balance support, job satisfaction, and inclusion. *Journal of Managerial Psychology*, 25(6), 578–595. https://doi.org/10.1108/ 02683941011056941.
- Neal, M. B., Hammer, L. B., & Morgan, D. L. (2006). Using mixed methods in research related to work and family. In M. Pitt-Cassouphes, E. Kossek, & S. Sweet (Eds.), *The work and family handbook: Multidisciplinary perspectives and approaches* (pp. 587–606). Lawrence Erlbaum.



- Olson, M. H., & Primps, S. B. (1984). Working at home with computers: Work and non-work issues. *Journal of Social Issues*, 40, 97–112.
- Parker, S. K., & Ohly, S. (2008). Designing motivating jobs. In R. Kanfer, G. Chen, & R. Pritchard (Eds.), work motivation: Past, present, and future (pp. 233-284). SIOP organizational Frontiers series. : Psychology press.
- Perrett, C. (2020). Apple CEO Tim Cook tells office employees to work from as the company plans to reduce 'human density' in stores amid coronavirus outbreak. https://www.businessinsider.com/coronavirus-apple-tim-cook-tells-office-workers-work-from-home-2020-3
- Shockley, K. M., & Allen, T. D. (2012). Motives for flexible work arrangement use. Community, Work, & Family, 15, 217–231. https://doi.org/10.1080/13668803.2011.609661.
- Spangler, P. T., Liu, J., & Hill, C. E. (2012). Consensual qualitative research for simple qualitative data: An introduction to CQR-M. In C. E. Hill (Ed.), Consensual qualitative research: A practical resources for investigating social science phenomena (pp. 269–283). American Psychological Association.
- Spaulding, D. (2020). At Zillow, we're offering most employees flexibility to WFH indefinitely. https://www.zillowgroup.com/news/zillow-announces-indefinite-work-from-home-policy/
- Standen, P. (2000). Organizational culture and telework. In K. Daniels, D. A. Lamond, & P. Standen (Eds.), Managing telework: Perspectives from human resource management and work psychology (pp. 31–42). Cengage Learning.
- Stephens, G. K., & Szajna, B. (1998). Perceptions and expectations: Why people choose a telecommuting work style. *International Journal of Electronic Commerce*, 3, 70–85. https://doi.org/10.1080/10864415. 1998.11518328.
- Stokols, D., & Novaco, R. W. (1981). Transportation and well-being. In I. Altman, J. F. Wohlwill, & P. B. Everett (Eds.), *Transportation and behavior* (pp. 85–130). Plenum. https://doi.org/10.1007/978-1-4684-4001-0_5.
- Sullivan, C., and Lewis, S. (2001). Home-based telework, gender, and the synchronization of work and family: Perspectives of teleworkers and their co-residents. Gender, Work, and Organization, 8 (2), 123-145.
- Thoits, P. A. (1991). On merging identity theory and stress research. Social Psychology Quarterly, 101–112. https://doi.org/10.2307/2786929.
- Thompson, R. J., Payne, S. C., & Taylor, A. B. (2015). Flexible work arrangements: Attraction to flextime, flexplace, or both? *Journal of Occupational and Organizational Psychology.*, 88(4), 726–749. https://doi.org/10.1111/joop.12095.
- Tremblay, D. G., Paquet, R., & Najem, E. (2006). Telework: A way to balance work and family or an increase in work-family conflict. *Canadian Journal of Communication*, *31*, 715–731.
- U. S. Merit Systems Protection Board (2011). Telework: Weighing the information, determining the appropriate approach. A report to the President and the Congress of the United States.
- U.S. Office of Personnel Management (2011). Guide to telework in the federal government. Retrieved on Dec 1, 2011 from: https://www.telework.gov/guidance-legislation/telework-guidance/telework-guide/guide-to-telework-in-the-federal-government.pdf
- Vega, R. P., Anderson, A. J., & Kaplan, S. A. (2015). A within-person examination of the effects of telework. *Journal of Business and Psychology*, 30(2), 313–323. https://doi.org/10.1007/s10869-014-9359-4.
- Williams, J. C. (2000). Unbending gender: Why family and work conflict and what to do about it. Oxford University Press.
- Wilton, R. D., Páez, A., & Scott, D. M. (2011). Why do you care what other people think? A qualitative investigation of social influence and telecommuting. *Transportation Research Part A*, 45, 269–282. https://doi.org/10.1016/j.tra.2011.01.002.

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