

# ARE TELECOMMUTERS REMOTELY GOOD CITIZENS? UNPACKING TELECOMMUTING'S EFFECTS ON PERFORMANCE VIA I-DEALS AND JOB RESOURCES

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Despite their widespread adoption, concerns remain that virtual work arrangements can harm employee job performance and citizenship behavior. Does telecommuting really hamper these critical dimensions of employee effectiveness? To answer this question, we develop a theoretical framework linking telecommuting to task and contextual performance via a dual set of mechanisms—reflecting proposed effects of *i-deals* and job *resources*. Further, we propose that the meaning of and outcomes from these paths depend on the social context surrounding telecommuting. We test the framework with field data from 323 employees and 143 matched supervisors across a variety of organizations. As predicted, we find that telecommuting is positively associated with task and contextual performance, directly and indirectly via perceived autonomy. These beneficial effects are contingent upon two aspects of the social context: leader-member exchange and signals of its normative appropriateness among coworkers and one's supervisor.

*“Speed and quality are often sacrificed when we work from home. . . . Beginning in June, we’re asking all employees with work-from-home arrangements to work in Yahoo! Offices”*—*Jackie Reses, Yahoo’s HR Head in a leaked memo (Swisher, 2013; italics added for emphasis)*

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Virtual work arrangements enable employees to perform tasks together even when they are physically apart (Bell & Kozlowski, 2002). Telecommuting, or virtual work from home, has moved from gaining a firm organizational foothold (Wiesenfeld, Raghuram, & Garud, 1999) to becoming part of the orthodoxy of modern human resource practices (Matos & Galinsky, 2012). Telecommuting is now seen as an important practice for recruiting and retaining valuable employees (SHRM, 2010) because it provides greater autonomy and subsequent satisfaction, including benefits to family life (Gajendran & Harrison, 2007).

Yet, Yahoo's recent decision to ban telecommuting aligns with a number of other misgivings that executives and firm policy makers have regarding such virtual arrangements. For example, Jack Welch, former CEO of GE, and Suzy Welch, former editor of *Harvard Business Review*, critiqued telecommuting as diminishing face time, which they argued made it difficult for managers to see "how calm you stay in a PR crisis, how decent you are to new employees who don't have the hang of things, how much you sweat during a tough deal, and how hard you work on a deadline without bitching and moaning" (Welch & Welch, 2007). Similarly, a summary of managerial concerns about telecommuting stated that "Managers are tempted to use 'face time' in the office as the de facto measurement of commitment and productivity. They are often suspicious about employees who work out of sight, believing they will shirk or drift if not under constant supervision" (Glass, 2013). These quotes from the popular press underscore a tension between telecommuting's popularity as a family-friendly work arrangement and managerial concerns that it imposes workplace productivity and social costs (Golden, 2007; Leslie, Manchester, Park, & Mehng, 2012; Thatcher & Bagger, 2011). In addition to concerns about task performance, managers of prospective telecommuters worry that interpersonal relationships and, therefore, contextual performance (Van Scotter & Motowidlo, 1996) suffer. Employees may be less available to provide the discretionary help and support critical for dealing with the many spontaneous workplace demands that cannot be anticipated or incorporated into formal job descriptions (e.g., Elsbach, Cable, & Sherman, 2010; Luckerson, 2012; Welch & Welch, 2007).

Does use of telecommuting decrease core dimensions of employee performance? Are telecommuters really poor organizational citizens (Organ, 1997)? Surprisingly, empirical research with remote workers is lacking that would allow an assessment of these concerns expressed by managers about diminished task and contextual performance. The most recent meta-analysis of telecommuting outcomes included only four studies of manager-rated performance (Gajendran & Harrison, 2007). Further, reflecting the lack of scholarly attention to citizenship-like behaviors among

telecommuters, the same meta-analysis omitted this crucial criterion dimension because zero prior studies had addressed it.

Therefore, the primary aim of this paper is to investigate telecommuting's links to employee task and, particularly, contextual performance. The latter is a set of interpersonal and volitional behaviors that contribute to the organization by creating a positive social and psychological climate (Borman & Motowidlo, 1997; Organ, 1997; Van Scotter & Motowidlo, 1996). It comprises two classes of behaviors—"interpersonal facilitation, which includes cooperative, considerate, and helpful acts that assist coworkers' performance, and *job dedication*, which includes self-disciplined, motivated acts such as working hard, taking initiative, and following rules to support organizational objectives" (Van Scotter & Motowidlo, 1996, p. 525). Task performance refers to in-role performance, typically measured by supervisor ratings (Harrison, Newman, & Roth, 2006).

To examine telecommuting's potential influence on these crucial yet understudied criteria, we draw together theorizing about idiosyncratic deals (i-deals; Rousseau, 2005) with insights from the job demands-resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) and the social information processing model (Salancik & Pfeffer, 1978) to build our theoretical framework. I-deals refer to individually negotiated work arrangements that are mutually beneficial to employees and employers (Rousseau, 2005). Flexible work arrangements such as telecommuting have been identified as a popular type of i-deal negotiated by employees (e.g., Hornung, Rousseau, & Glaser, 2008; Rosen, Slater, & Johnson, 2013; Rousseau, Ho, & Greenberg, 2006).

Other researchers have proposed that telecommuting, along with other virtual and flexible work arrangements, influences key employee outcomes because it enhances employee experiences of autonomy (Allen, Renn, & Griffeth, 2003; Gajendran & Harrison, 2007; Kossek, Lautsch, & Eaton, 2006). According to the JD-R model, which classifies working conditions associated with each organizational context as either job demands or job resources, autonomy is a valuable job resource (Bakker & Demerouti, 2007; Demerouti & Bakker, 2011). Resources refer to those aspects of jobs that enable employees to meet work-related goals, achieve personal growth and development, and effectively counter job demands and their associated costs. In contrast, job demands refer to those conditions necessitating sustained cognitive, emotional, or physical efforts that are associated with physiological and/or psychological drains.

Research viewing telecommuting as an i-deal has largely proceeded independently of research viewing it as a virtual work arrangement that

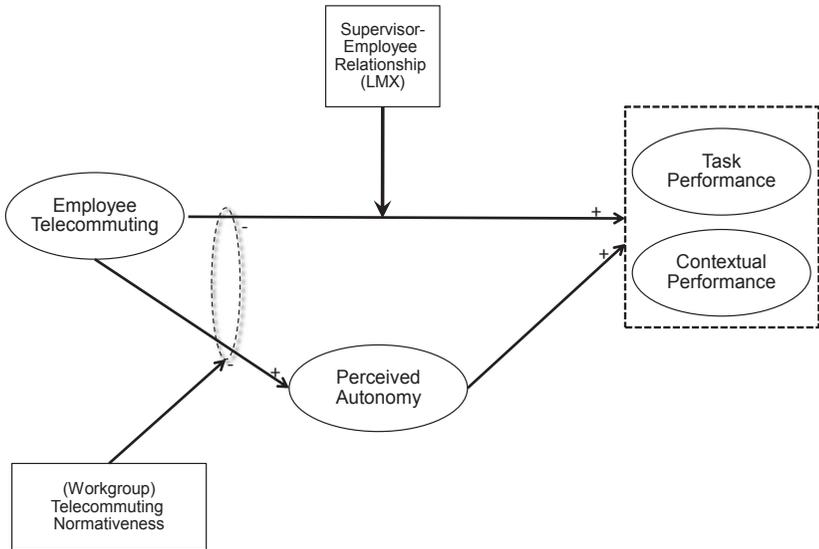
enhances the resource of autonomy. A key contribution of this paper is to integrate these hitherto distinct streams of research into a unified theoretical model. We do so in a way that links telecommuting to effectiveness outcomes via two paths corresponding to enhanced meaningfulness of the arrangement to the individual: an *i-deals pathway* based on social exchange and reciprocity, along with a *job resources pathway* based on telecommuting as a source of employees' experienced autonomy.

We further argue that employee sensemaking about each of these pathways depends on the workplace *social context* surrounding telecommuting arrangements. For instance, because the distinctiveness of an i-deal may depend on the relative selectness of its availability, the extensiveness of supervisor and coworker telecommuting may act as social cues that influence how employees interpret their own virtual work arrangement (Salancik & Pfeffer, 1978). Likewise, the substantive and symbolic meanings associated with an i-deal may depend on the quality of employee exchanges with their supervisor (Anand, Vid-yarthi, Liden, & Rousseau, 2010). Therefore, another contribution of this paper is its examination of the proposition that telecommuting's implications for employee effectiveness are intricately linked to and contingent on two key aspects of the *social context*: leader-member exchange (LMX; Graen, 1976; Graen & Scandura, 1987) and normativeness of telecommuting in the workgroup. The latter construct, referring to the use of telecommuting by supervisors and coworkers, provides information about the (lack of) exclusivity of employees' own telecommuting arrangement.

Figure 1 presents the conceptual framework underpinning our study, which we test using a sample that includes matched pairs of employees and supervisors spanning over 100 organizations. Controlling for industry, organizational, and job-related factors, we develop hypotheses and boundary conditions about the two distinct but complementary perspectives linking telecommuting to task and contextual performance: i-deals and job resources.

### *Background and Theory Development*

Telecommuting is a distributed work mode that enables employees to perform tasks while working from remote locations (such as home or satellite offices) using information and communication technologies to interact with others within and outside the workplace (Bailey & Kurland, 2002; Raghuram, Tuertscher, & Garud, 2010; Thatcher & Zhu, 2006; Venkatesh & Johnson, 2002). It can be practiced both as a full-time arrangement in



**Figure 1: Theoretical Framework Linking Employee Telecommuting to Task and Contextual Performance.**

which employees typically work from home for 5 or more days a week, or as a part time arrangement in which employees alternate days working at home and at a central work location.

Telecommuting research has used two related logics for demonstrating its influence on relevant outcomes. As a first step, researchers have been interested in the arrangement as a whole, examining outcomes of telecommuters versus nontelecommuters (e.g., Hill, Hawkins, & Miller, 1996; Igarria & Guimares, 1999; Lautsch, Kossek, & Eaton, 2009). As a second step beyond treating telecommuting as a dichotomous phenomenon (users vs. nonusers), researchers have also examined the implications of gradations in the use of telecommuting, operationalized in terms of hours (or days) per week telecommuted because it provides added insight about telecommuting's impact on employee attitudes and outcomes (e.g., Golden, Veiga, & Simsek, 2006). With respect to the latter treatment, we refer to the extensiveness of employee telecommuting (e.g., hours per week) as *telecommuting intensity*, which can range from the part- to full-time modes mentioned above (Fay & Kline, 2011, 2012; Gajendran & Harrison, 2007). Following prior research, our study examines the consequences of telecommuting by treating it both as a dichotomous phenomenon (telecommuters vs. nontelecommuters) and then as telecommuting intensity.

*Linking Telecommuting to Task and Contextual Performance: An I-Deals Perspective*

Research on idiosyncratic work arrangements finds that location and schedule flexibility are valuable resources that are commonly exchanged in i-deals across different firms (Hornung et al., 2008; Hornung, Rousseau, & Glaser, 2009; Rousseau, Hornung, & Kim, 2009). Corroborating research on i-deals, studies about flexible work arrangements also validate the idea that telecommuting is a nonstandard, customizable, and individually negotiated work arrangement. For instance, prior research indicates that supervisors often act as gatekeepers, deciding who can or cannot have access to flexible work arrangements such as telecommuting (e.g., Kelly & Kalev, 2006; Lautsch et al., 2009; Thompson, Beauvais, & Lyness, 1999).

According to i-deals theory, the implications of providing employees with work arrangements such as telecommuting can best be understood from the standpoint of social exchange theory (Blau, 1964) and the norm of reciprocity (Gouldner, 1960). Flexibility is highly valued by employees because of its potential benefits for the work–family interface (Allen, Johnson, Kiburz, & Shockley, 2013; Hornung et al., 2008; Hornung et al., 2009; Rousseau et al., 2006). Social exchange theory would indicate that recipients of flexibility i-deals are likely to feel obligated toward those who approved of their special work arrangement, which in the case of telecommuting is typically the employee’s immediate supervisor. To discharge that upward obligation, employees may not only be motivated to enhance their task performance but may also reciprocate through discretionary citizenship behaviors, including showing greater job dedication (Greenberg, Roberge, Ho, & Rousseau, 2004).

Benefits for individual employees notwithstanding, i-deals could impose significant burdens on their recipients’ coworkers who may have to make adjustments to their tasks and responsibilities (Rousseau, 2005). In addition, i-deals could stoke resentment among coworkers who do not receive such singular special treatment (Rousseau et al., 2006). Echoing this possibility, research finds that as telecommuting becomes more prevalent in the workgroup, it decreases job satisfaction and flexibility of office-based coworkers by increasing the “scope and amount of workload experienced by those remaining in the office, since nonteleworking individuals must often assume additional responsibilities which might otherwise be handled by a teleworker but which are not due to their absence” (Golden, 2007, p. 1644). Similarly, in a qualitative study, Lautsch et al. (2009) report that telecommuters are aware that coworkers believe that they “have easier work and receive favoritism from management, thereby making nontelecommuters’ work lives and work–family

relationships harder” (p. 811). To minimize the risk of social recrimination from coworkers, telecommuters are likely to proactively step up efforts to help their coworkers (interpersonal facilitation) (Anand et al., 2010; Rousseau, 2005).

In sum, the obligation to reciprocate the special privilege of access to telecommuting and a motivation to minimize coworker resentment would lead telecommuters to exert greater efforts in task and contextual performance domains. As telecommuting intensity increases, the pressure to reciprocate and to manage coworker expectations is likely to be felt more acutely. Telecommuters, therefore, are likely to work harder and longer than in-office workers toward completing their tasks and helping others, expecting that they have to go “above and beyond” because their efforts may not be as routinely visible to others as they would be at a central work location (e.g., Gallup, 2013; Mulki, Bardhi, Lassar, & Nanavaty-Dahl, 2009).

*Hypotheses 1 a-b:* (a) Telecommuting will be positively associated with employee task performance and contextual performance. Specifically, employees who use telecommuting arrangements will have higher task performance and contextual performance compared to employees who do not. (b) Further, telecommuting intensity will be positively associated with task performance and contextual performance.

A key premise underlying i-deals theory is that the meaning of an i-deal depends on the context in which it is provided (Rousseau et al., 2006). One such contextual variable that has been the subject of theoretical (Rousseau et al., 2006) and empirical attention (e.g., Anand et al., 2010) is LMX (Graen, 1976; Graen & Scandura, 1987), which refers to the quality of the employee–supervisor exchange relationship. High-quality LMX relationships, following the logic of social exchange, are characterized by trust, loyalty, and professional respect. In contrast, low-quality LMX relationships are governed by the terms of the employment contract, which typically involves direct supervision and an emphasis on close performance monitoring, accompanied by contingent reward and punishments. Prior research has assessed LMX quality from employee and supervisor perspectives (Sin, Nahrgang, & Morgeson, 2009). Because our focus is on the *provision* of substantive resources such as i-deals by managers to the employees, LMX quality assessed from the manager’s perspective is particularly relevant; hence, arguments below are based on the manager’s perspective of LMX.

Managers in a high-quality LMX relationship with their subordinates are likely to provide employees with a set of wide-ranging instrumental

and socioemotional resources that include a great deal of latitude in negotiating work conditions and other benefits (Graen & Uhl-Bien, 1995; Wayne, Shore, & Liden, 1997). In this high LMX context, a telecommuting i-deal is likely to be received by employees as part and parcel of *existing* (or *expected*) elements of broad resources provided by the manager, which could reduce the distinctiveness of remote work arrangements. Further, because managers expect that subordinates “can be trusted (*especially when not being watched by the supervisor*)” (Liden and Graen, 1980, p. 451, emphasis added), they are likely to provide all high LMX subordinates, whether or not they telecommute, greater flexibility over where, when, and how work gets done. Therefore, for subordinates, incremental flexibility afforded by a telecommuting i-deal is likely to have only modest value.

In contrast, managers in a low-quality relationship with their subordinates are likely to provide them a limited set of resources in line with the employment contract. They are also likely to engage in ongoing performance monitoring to ensure compliance with the employment contract. In this low LMX context, offering a telecommuting i-deal is a strong, salient signal of worth to employees, as well as a major uptick in what had been a narrow or restricted employee role. Altogether, a telecommuting i-deal is likely to provide more value to employees in low LMX relationships compared to those in high LMX relationships. Consequently, the strength of obligation employees experience toward their supervisors, and hence their willingness to reciprocate via higher task and contextual performance, is likely to be higher for low LMX employees compared to high LMX employees (e.g., Anand et al., 2010; Sparrowe, Soetjito, & Kraimer, 2006). In other words, more rigid exchange norms govern low LMX relationships of supervisor. Therefore, the provision of the special arrangement of telecommuting by the supervisor will create greater change to the status quo of the relationship—which will need to be met with increased subordinate efforts toward performance.

*Hypothesis 2:* The positive effect of telecommuting intensity on task performance and contextual performance will be moderated by LMX such that the effect will be stronger when LMX is low and weaker when LMX is high.

*Linking Telecommuting to Task and Contextual Performance via Perceived Autonomy: A Job Resources Perspective*

A key conceptual theme underlying theorizing about telecommuting is that it enhances perceived autonomy (e.g., Allen et al., 2003; DuBrin, 1991; Feldman & Gainey, 1997; Golden, 2006), which refers to

employees' personal assessments of the degree to which they can structure where, when, and how they perform activities associated with their jobs (Spector, 1986). Telecommuting affords employees greater control over the location and often, the timing, of work (Kossek et al., 2006). It gives employees the capability to perform tasks while working from remote locations such as home, cafés, satellite offices, and telework centers. Likewise, because they work at a physical and psychological distance from the direct supervision of managers (Allen et al., 2003; DuBrin, 1991; Perlow, 1998), telecommuters may be able to proactively reconfigure their duties and responsibilities to support greater schedule flexibility (e.g., Feldman & Gainey, 1997; Harrison, Johns, & Martocchio, 2000; Kossek, Lautsch, & Eaton, 2005; Kurland & Bailey, 1999; Rau & Hyland, 2002; Van Sell & Jacobs, 1994). Working remotely from their coworkers also provides telecommuters greater control over managing their access to, and interruptions from, others (Fonner & Roloff, 2010, 2012; Golden & Fromen, 2011; Golden & Veiga, 2008; Venkatesh & Vitalari, 1992). Greater control over location, timing, and means of work are likely to be reflected in employees' overall perceptions of job autonomy.

The aforementioned set of arguments leads us to propose that telecommuters are likely to experience greater perceived autonomy compared to those who do not use this work arrangement (Hill et al., 1996). Further, perceived autonomy is likely to be influenced by telecommuting intensity—the more extensive telecommuting is, the higher the discretion employees perceive over where and when they work. Meta-analytic evidence also supports a monotone link between telecommuting and perceived autonomy (Gajendran & Harrison, 2007).

*Hypotheses 3 a-b:* (a) Telecommuting will be positively associated with employee perceived autonomy. Specifically, employees who use telecommuting arrangements will report higher levels of autonomy compared to employees who don't. (b) Telecommuting intensity will be positively associated with perceived autonomy.

A fundamental mechanism underlying the theorizing about job resources in the JD-R model is conservation of resources (COR; Hobfoll, 2001). A key tenet of COR is that resources acquired by individuals are invested in efforts to obtain additional resources. As employees gain skills and expertise at work, they reinvest these resources to acquire other resources such as pay and social capital (e.g., Seibert, Kraimer, & Liden, 2001). The COR principle also proposes that individuals invest resources in ways that maximize their returns, which means recirculating resources in domains that are most consistent or aligned with their content (Hobfoll, 2001). For instance, work-related resources are more likely to be

re-invested at work (Halbesleben & Wheeler, 2008). Thus, employees with surplus job resources such as autonomy are likely to maximize their return by reinvesting them via improving their task performance or performing citizenship behaviors (Halbesleben, Harvey, & Bolino, 2009; Saks, 2006; Salanova, Agut, & Peiro, 2005). A related perspective comes from resource theory (e.g., Edwards & Rothbard, 2000), which also argues that work resources are more likely to be reinvested in work domains rather than family (or other) domains. In addition to constraints on cross-domain transfer (Allen et al., 2013), it is fairly easy to justify such resource investments in work as likely to yield material support for family well-being in the long run. Taken together, insights from the JD-R model, COR principles, and resource theory suggest that telecommuters are likely to channel surplus work resources such as autonomy toward task performance and citizenship behaviors.

Why is perceived autonomy a crucial psychological resource for sustaining individual performance? One answer is that it increases employee motivation because it satisfies intrinsic employee needs for self-determination and meaning (Ryan & Deci, 2000). Another answer comes from job characteristics theory, which argues that autonomy promotes greater employee motivation, effort, and efficiency at completing in-role tasks (Hackman & Oldham, 1976; Skinner, 1996), which could potentially free up cognitive and temporal resources crucial for contextual performance. Finally, empirical research on the JD-R model finds that autonomy-related resources increase work engagement, which in turn increases task performance and citizenship behavior (Bakker, Demerouti, & Verbeke, 2004).

*Hypotheses 4 a-b:* (a) Employee perceived autonomy will be positively associated with task and contextual performance. (b) Further, perceived autonomy will play the role of an intervening variable in carrying the indirect effect of telecommuting on task and contextual performance.

#### *Moderating Effects of Workgroup Telecommuting Normativeness*

According to social information processing theory (Salancik & Pfeffer, 1978), individuals rely on cues from their interpersonal environment to shape their interpretation of workplace actions and events. Supervisor and coworker actions constitute a vivid stream of information that provides employees with a framework to interpret their own behavior. Information from the social environment structures “a person’s attentional processes, making aspects of the environment more or less salient” (Salancik & Pfeffer, 1978, p. 229). Accordingly, supervisor and coworker

telecommuting represent social information that directs attention toward the “specialness” of telecommuting in the workgroup. Telecommuters are likely to use their immediate social environment—coworkers and supervisors in their workgroup—as a reference group to assess the exclusivity of their i-deal. That social information has implications for the intensity of the motivation to reciprocate access to telecommuting (Hypotheses 1a–b) and the degree of autonomy experienced from telecommuting (Hypotheses 4a–b).

When they are the *only* individuals that telecommute or are part of a small fraction of the workgroup that has access to telecommuting, employees are likely to perceive their virtual arrangement as a special perquisite. Consequently, they are especially likely to feel beholden to their managers and the organization for giving them a special deal (Rousseau et al., 2006). In contrast, as the proportion of workgroup telecommuters increases and/or as their supervisors also telecommute, employees are likely to experience their telecommuting as a relatively customary or normative aspect of their workplace, which could diminish the distinctiveness of their negotiated work arrangement. Such normativeness also enhances the legitimacy of telecommuting in the eyes of coworkers, which weakens the employee motivation to direct citizenship contributions to proactively minimize anticipated negative reactions. In sum, as workgroup telecommuting normativeness (referred to as normativeness) increases, it weakens the intensity of the need to reciprocate the provision of a telecommuting i-deal. This is likely to attenuate the positive relationship between telecommuting and task and contextual performance.

Normativeness also influences the extent to which employees perceive autonomy from telecommuting. When workgroup telecommuting normativeness is low, it makes more salient the increased psychological control a telecommuter has over the location and timing of work, especially because others in the workgroup do not have access to it. As telecommuting intensity increases, it further accentuates the distinction between telecommuters and their in-office coworkers with regard to the degree of autonomy experienced. In contrast, when telecommuting is normative, autonomy from it is less salient to telecommuters because others too are perceived to have similar levels of location and schedule control. These arguments suggest a weaker boost in autonomy for employees embedded in workgroups where telecommuting is normative.

*Hypotheses 5 a-c:* Workgroup telecommuting normativeness will attenuate the positive relationship between telecommuting intensity and (a) task performance and (b) contextual performance. (c) In addition, normativeness will moderate the telecommuting

intensity–perceived autonomy relationship. The positive effect of telecommuting intensity on perceived autonomy will be stronger when telecommuting normativeness is low compared to when it is high.

### *Method*

#### *Sample and Procedure*

Providing a robust test of our hypotheses required sampling from a wide assortment of organizations that vary in the extent of telecommuting afforded to employees. Full-time, working individuals who were nominated and then consented to participating in a research survey were initially contacted by undergraduate students in upper-level business courses at a large, public university in the northeastern United States (e.g., Grant & Mayer, 2009; Lian, Ferris, & Brown, 2012; Morgeson & Humphrey, 2006). Each participating undergraduate received one questionnaire packet that contained explicit instructions, a questionnaire, and a return envelope for the employee survey, as well as additional instructions, a different questionnaire, and a return envelope that employees were to give to their supervisor. The latter instrument contained items about the focal employees' task and contextual performance and LMX. Approximately 500 undergraduates received questionnaire packets. If the employee and/or supervisor returned surveys, the nominating student was awarded extra credit in the course. A total of 323 employees returned questionnaires. All employees and supervisors who returned surveys were awarded electronic gift certificates to a well-known Internet shopping site. We also took several steps, which are listed in Appendix A, to ensure that only full-time employees participated and to minimize the possibility of fraudulent responses by students.

Forty-seven percent of the participants in the ( $n = 323$ ) employee sample were male, 53% had a college degree, 17% had associate degrees, and 30% had high school diplomas. Their median organizational tenure was 6 years. Of these 323 employees, we received matched supervisor responses for 143 employees.<sup>1</sup> Of the 143 supervisors, 61% were male, 48% belonged to upper management, 38% were in middle management, and 13% were in the lower management levels of their organization.

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<sup>1</sup>We checked for possible nonresponse bias in the matched dataset by comparing the responses of employees whose supervisor returned their survey to responses of those whose supervisors did not. No significant differences in demographic, psychological, or behavioral variables were detected.

The median organizational tenure for supervisors was 12 years. The median organization size was 105 employees. Major industries represented in the sample included high technology, banking, healthcare, insurance, education, manufacturing, transportation, waste management, and social services.

### *Measures*

*Telecommuting and telecommuting intensity.* We first assessed employees' telecommuting status by asking whether they worked from home during regular office hours, worked from a virtual office (work from anywhere), or worked from a satellite office/telework center (Thatcher & Zhu, 2006). Employees who reported using one or more of such telecommuting arrangements were coded 1 and those who did not telecommute were coded as 0. Approximately 37% of our sample reported that they used telecommuting arrangements. Working from home was the primary telecommuting location for over 80% of telecommuters. We assessed *employee telecommuting intensity*, which refers to the extensiveness of employee telecommuting arrangements, by asking telecommuters how many hours they telecommuted each week (Golden & Veiga, 2005). Scores ranged from 0 to a maximum of 44 hours per week.

*Perceived autonomy.* Our measure of perceived autonomy reflects employee perceptions of control over workplace spatial and temporal boundaries. Perceived job autonomy is maximized when employees are able to choose their location and timing of work independent of their supervisors and coworkers. Correspondingly, items from the autonomy dimension of the Sims, Szilagyi, and Keller (1976) Job Characteristics Inventory were modified slightly to indicate employee feelings about these two dimensions (see Hill et al., 1996; Hill, Miller, Weiner, & Colihan, 1998; and Kossek et al., 2006 for a similar approach). Three items assessed employee discretion over deciding their location of work (e.g., To what extent are you able to define your work location independently of others?). Similarly, another three items measured employee discretion over their work schedules (e.g., How much discretion can you exercise in defining your work schedule?). Appendix B provides a complete listing for this measure. These items were summed, and the estimated reliability for the six-item total was  $\alpha = .91$ .

*Task performance.* The design of our investigation deliberately sampled across organizations and jobs to capture variance in the attributes of telecommuting arrangements and allow for stronger tests of moderation. Rather than develop specific evaluations of performance, we asked supervisors to provide generic ratings of employee performance. Supervisors used a within-persons distributed rating system (Mabe & West, 1982),

indicating the percentage of time the employee's work was excellent, above average, average, below average, and poor, with the percentages totaling 100%. To reduce the ipsative nature of our measure, we created two components. The first component consisted of the sum of the standardized percentages given to the "excellent" and "above average" strata. The second component consisted of the reverse-scored sum of standardized percentages on the "average," "below average," and "poor" strata. We then added together the two components ( $\alpha = .71$ ).

*Contextual performance.* Supervisors provided ratings of contextual performance using a 15-item instrument developed and validated by Van Scotter and Motowidlo (1996). The measure spanned two dimensions of contextual performance: *interpersonal facilitation* (7 items) and *job dedication* (8 items). Examples of items assessing interpersonal facilitation included "supported or encouraged other workers" and "encouraged others to overcome differences." Example items assessing job dedication were "put in extra hours to get work done" and "persisted in overcoming obstacles." Supervisors used five-point Likert type responses with anchors ranging from 1 = *never behaved this way* to 5 = *often behaved this way*. The estimated reliability was  $\alpha = .86$  for interpersonal facilitation and  $\alpha = .90$  for job dedication.

*Leader member exchange (LMX).* Because of the study's focus on managers' provision of resources to employees as a basis for social exchange, we measured LMX from the supervisor's perspective using a seven-item scale developed by Graen and Uhl-Bien (1995). Sample items include "How well do you think you understand this employees' problem & needs?" and "How often would you be willing to 'bail out' this employee?" Supervisors recorded their responses on a five-item scale ranging from 1 = *never* to 5 = *always*. The coefficient alpha for this scale was .76.

*Telecommuting normativeness.* We operationalized workgroup telecommuting normativeness by using supervisors' reports on two indicators: workgroup telecommuting prevalence and supervisor telecommuting intensity. Workgroup prevalence was measured using supervisor reports of the estimated percentage of coworkers in the focal employees' workgroup that regularly telecommuted. Supervisor telecommuting intensity followed the same instructions as employee telecommuting intensity; it was measured by asking supervisors how many hours they telecommuted each week. The pattern of results reported in this paper are substantively similar to those obtained by using either indicator individually. Therefore, we standardized and combined the two indicators into a single index of normativeness ( $\alpha = .73$ ).

*Control variables.* We controlled for industry effects by categorizing respondents into dummy variables indicating three broad industry groups—industrials and agriculture, transportation and trade, and services.

To facilitate interpretation of dummy variable signs, the omitted category included in the intercept was industrials and agriculture. We controlled for organization size by creating a variable that was the natural logarithm (to correct for positive skew) of the reported number of employees in the focal respondent's organization. We also controlled for perceived organizational support, a potential confound for perceived autonomy, using a nine-item measure ( $\alpha = .90$ ) from Eisenberger, Fasolo, and Davis-LaMastro (1990).

The opportunity to telecommute and the level of perceived autonomy may reflect preexisting occupational autonomy (Golden & Veiga, 2005), which refers to employee discretion over means, methods, and scheduling of work that is on average available to jobs in a specific occupational class. Our sample consisted of respondents from different positions that likely vary in the levels of occupational autonomy afforded to incumbents, outside of participation in telecommuting. Therefore, we controlled for such differences by creating an index of occupational autonomy using two work context job variables from the O\*NET ([www.onetonline.org](http://www.onetonline.org)): freedom to make decisions and structured versus unstructured work (Dierdorff, Rubin, & Morgeson, 2009). We also controlled for differences among respondents in their task interdependence because it could influence perceived autonomy: Employees in jobs with low task interdependence are likely to report higher autonomy compared to those with jobs involving high task interdependence. Furthermore, it can be argued that employees who have spent more time in their current organization may be more likely to be allowed to participate in telecommuting arrangements and more likely to experience greater discretion over where, when, and how they work. Therefore, we controlled for tenure within the study. Finally, we also controlled for employee gender (male = 1, female = 0).

#### *Evidence for Construct Validity*

We conducted a confirmatory factor analysis (CFA) to demonstrate the discriminant validity of the latent constructs included in our theoretical model. To improve our parameter estimates to sample size ratio, we created item parcels using random assignment for each of the measures (Bagozzi & Edwards, 1998; Little, Cunningham, Shahar, & Widaman, 2002). Three employee source measures—perceived autonomy, organizational support, and job interdependence—were included in a model that was hypothesized to have three latent constructs. Results suggested that this model (chi-square,  $df = 32 = 69.24$ , RMSEA = .06, NNFI = .96, SRMR = .05) had very good fit and had a better fit compared to alternate one- (chi-square,  $df = 35 = 875.92$ , RMSEA = .28, NNFI = .20, SRMR = .21)

and two-factor models (chi-square,  $df = 34 = 500.33$ , RMSEA = .21, NNFI = .55, SRMR = .16). Likewise, a CFA of four manager-rated measures—task performance, interpersonal facilitation, job dedication, and LMX—indicated a very good fit to a model hypothesized to have four latent constructs (chi-square,  $df = 38 = 55.47$ , RMSEA = .06, NNFI = .97, SRMR = .04). This model also fit better than alternate three-(chi-square,  $df = 41 = 179.35$ , RMSEA = .16, NNFI = .77, SRMR = .08), two-(chi-square,  $df = 43 = 212.44$ , RMSEA = .17, NNFI = .73, SRMR = .10), and one-factor models (chi-square,  $df = 44 = 267.60$ , RMSEA = .19, NNFI = .96, SRMR = .11).

### *Results*

Table 1 provides descriptive statistics for variables used in tests of our hypotheses, as well as correlations among these variables. We used multiple regression analysis to test all our hypotheses. Hypothesis 1a predicted that employee telecommuting (yes = 1 vs. no = 0) would be positively related to task and contextual performance. Telecommuting as a dichotomous indicator of a workplace arrangement was positively and significantly associated with task performance (Table 2, Model II: standardized  $\beta = .20$ ;  $p < .05$ ); it explained an additional 4% of the variance in this elemental criterion. Its positive effects on both dimensions of contextual performance were also significant (Table 3, Model II; job dedication: standardized  $\beta = .15$ ;  $p < .05$ ,  $\Delta R^2 = .02$ ; interpersonal facilitation: standardized  $\beta = .16$ ;  $p < .05$ ,  $\Delta R^2 = .04$ ). Thus, Hypothesis 1a was supported. Findings for tests of Hypothesis 1b mirrored those above. Telecommuting intensity was positively and significantly associated with task performance (Table 2, Model III; standardized  $\beta = .16$ ;  $p < .05$ ), explaining an additional 2% variance in that variable. Positive effects were also observed on both dimensions of contextual performance (Table 3, Model III; job dedication: standardized  $\beta = .15$ ;  $p < .05$ ,  $\Delta R^2 = .02$ ; interpersonal facilitation: standardized  $\beta = .16$ ;  $p < .05$ ,  $\Delta R^2 = .02$ ).

Hypothesis 2, which predicted that the positive relationship between telecommuting intensity and employee effectiveness would be moderated by LMX, was supported for all three aspects of the criterion. The coefficients of the interaction term formed by multiplying employee telecommuting intensity with LMX were negative and significant for each of the three dependent variables: task performance, job dedication, and interpersonal facilitation [(task performance:  $\beta = -.20$ ,  $p < .05$ : Table 2 Model V; job dedication:  $\beta = -.21$ ,  $p < .05$ : Table 3, Model V; interpersonal facilitation:  $\beta = -.21$ ,  $p < .05$ : Table 3, Model V)]. Interaction terms were mean centered prior to entering them in

TABLE 1  
*Descriptive Statistics and Correlations<sup>a,b</sup>*

	Mean	SD	1	2	3	4	5	6
1. Industry–transportation and trade	.17	.37						
2. Industry–services	.68	.47	-.67**					
3. Organization size	5.34	2.83	-.07	-.02				
4. Perceived organizational support	5.03	1.16	-.01	.05	-.26**			
5. Occupational autonomy	80.36	9.91	-.03	-.02	.02	.12*		
6. Job interdependence	5.50	1.03	-.10	.11**	.12**	.22**	.05	
7. Gender (M = 1; F = 0)	.53	.50	-.12*	.23**	-.08	.09	-.12*	.02
8. Organizational tenure	10.44	9.58	-.02	-.11	.25**	-.04	.23**	.05
9. Employee telecommuting (Yes = 1; No = 0)	.37	.48	-.05	-.05	.10	.15**	.21**	.09
10. Employee telecommuting intensity	10.74 <sup>c</sup>	9.19	-.04	.03	.07	.10	.19**	-.01
11. Telecommuting normativeness	-.10	.70	.03	-.01	-.03	.08	.06	.00
12. Perceived autonomy	2.86	1.13	.05	-.08	-.01	.18**	.24**	.09
13. LMX	3.30	.41	.04	.05	-.02	.22**	.19*	.33**
14. Contextual performance – interpersonal facilitation	3.9	.72	-.10	.08	-.03	.23**	.03	.25**
15. Contextual performance – job dedication	3.97	.85	-.07	-.01	.05	.14	.09	.20*
16. Task performance	.00	9.09	-.01	.03	-.04	.09	.05	.25**
	7	8	9	10	11	12	13	14
1. Industry–transportation and trade								
2. Industry–services								
3. Organization size								
4. Perceived organizational support								
5. Occupational autonomy								
6. Job interdependence								
7. Gender [M = 1; F = 0]								
8. Organizational tenure	-.02							
9. Employee telecommuting (Yes = 1; No = 0)	-.14*	.05						
10. Employee telecommuting intensity	-.04	-.01	.68**					
11. Telecommuting normativeness	-.04	-.05	.44**	.52**				
12. Perceived autonomy	-.11	.09	.39**	.38**	.28**			
13. LMX	.04	.12	.12	.11	.00	.26**		
14. Contextual performance–interpersonal facilitation	.05	.16	.18*	.17*	.08	.31**	.34**	

*continued*

TABLE 1 (continued)

	7	8	9	10	11	12	13	14	15
15. Contextual performance–job dedication	.03	.03	.17*	.15	.02	.28**	.45**	.56**	
16. Task performance	-.04	.04	.22*	.15	.11	.41**	.48**	.29**	.51**

Note. <sup>a</sup>Average  $N = 318$  for correlations among employee source data; <sup>b</sup>average  $N = 142$  for correlations with contextual performance, <sup>c</sup>mean and standard deviation calculated for telecommuters.

\* $p < .05$ . \*\* $p < .01$ .

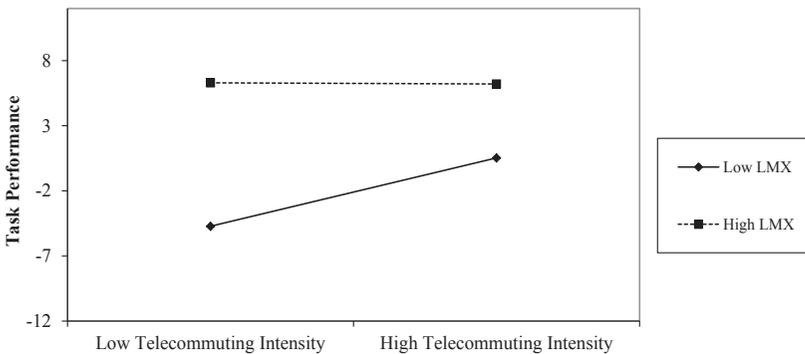


Figure 2: Interaction Between Employee Telecommuting Intensity and LMX Predicting Task Performance.

the regression model. Adding the interaction term to the model containing all the main effects explained an incremental variance of 3% in task performance, 4% in job dedication, and 4% and interpersonal facilitation.

To aid in the interpretation of these interaction effects, we plotted high and low levels of each variable ( $\pm 1 SD$  above and below the mean) using procedures outlined by Aiken and West (1991) for each of the three dependent variables. Task performance is shown in Figure 2, job dedication is shown in Figure 3, and interpersonal facilitation is shown in Figure 4. Consistent with Hypothesis 2, the effect of telecommuting intensity on each of these three criteria was stronger when LMX was low and weaker when LMX was high. Simple slopes tests of the regression lines at low and high levels of LMX offer further support. For the telecommuting–task performance relationship, the low LMX slope was  $\beta = .35$ ,  $p < .05$  and the high LMX slope was  $\beta = -.01$ , *n.s.* For the telecommuting–job dedication relationship, slopes were low LMX:  $\beta = .04$ ,  $p < .01$  versus high LMX:

TABLE 2  
*Multiple Regression Results for the Test of Hypotheses 1a–b, 2, and 5a–b  
 Involving Task Performance<sup>a</sup>*

	Task performance					
	I	II	III	IV	V	VI
Industry–transportation and trade	.07	.08	.06	–.11	–.12	–.10
Industry–services	.08	.10	.09	–.05	–.08	–.07
Organization size	–.08	–.13	–.14	–.10	–.10	–.10
Perceived organizational support	–.01	–.09	–.13	–.08	–.05	–.06
Occupational autonomy	.01	–.01	.05	–.04	–.07	–.11
Job interdependence	.24*	.24*	.20*	.14	.16*	.14
Gender (M = 1; F = 0)	–.03	–.01	–.03	–.07	–.06	–.05
Organizational tenure	.06	.09	.09	.01	.00	–.01
Employee telecommuting (Yes = 1; No = 0)		.20*				
Employee telecommuting intensity			.16*	.07	.15	.22*
LMX				.45**	.48**	.48**
Telecommuting normativeness				.08	.04	.16
Employee telecommuting Intensity × LMX					–.20*	–.19*
Employee telecommuting intensity × telecommuting normativeness						–.23*
<i>F</i>	1.03	1.50	1.05	3.52**	3.73**	3.89**
<i>R</i> <sup>2</sup>	.06	.10	.08	.27	.30	.33
$\Delta R^2$	.06	.04*	.02*	.27**	.03*	.03*
Adj. <i>R</i> <sup>2</sup>	.00	.03	.01	.19	.22	.25

Note. One-tailed test. <sup>a</sup>Tabled values are standardized regression weights.  $\Delta R^2$  Comparisons: Models II and III with I; Average listwise  $n = 128$  for models including manager source data.

\* $p < .05$ . \*\* $p < .01$ .

$\beta = .01$ , *n.s.* For the telecommuting–interpersonal facilitation relationship, slopes were low LMX:  $\beta = .03$ ,  $p < .05$  versus high LMX:  $\beta = .00$ , *n.s.*

We found clear, statistically significant support for Hypothesis 3, even in the presence of many controls such as O\*Net occupational autonomy. Employees that telecommuted reported higher levels of perceived autonomy than those who did not (standardized  $\beta = .35$ ;  $p < .01$ ; Table 4, Model II). Further, telecommuting intensity was significantly and

TABLE 3  
*Multiple Regression Results for the Test of Hypotheses 1a-b, 2, and 5a-b Involving Contextual Performance<sup>a</sup>*

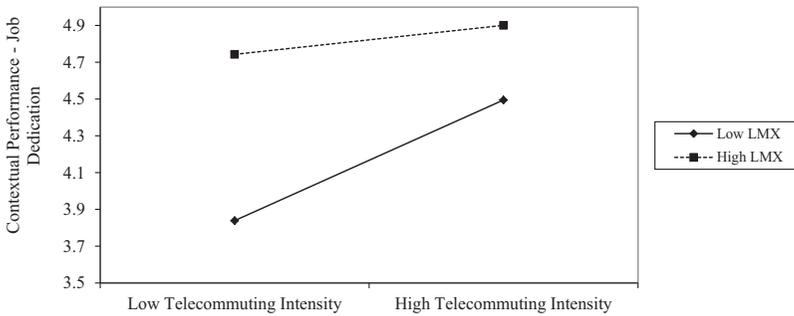
	Job dedication						Interpersonal facilitation					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI
Industry-transportation and trade	-.16	-.15	-.17	-.24*	-.26*	-.25*	-.06	-.07	-.06	-.06	-.08	-.09
Industry-services	-.16	-.16	-.17	-.27*	-.30*	-.29*	.01	.00	.00	.01	-.02	-.02
Organization size	.04	.00	-.01	-.03	-.03	-.03	-.10	-.10	-.12	-.09	-.08	-.08
Perceived organizational support	.06	-.02	-.05	-.09	-.05	-.06	.08	.08	.04	.04	.07	.07
Occupational autonomy	.08	.07	.11	.03	-.01	-.04	.00	-.05	-.01	-.04	-.07	-.07
Job interdependence	.16*	.15	.14	.09	.10	.09	.17*	.20*	.19*	.09	.10	.10
Gender (M = 1; F = 0)	.06	.08	.08	.06	.06	.07	.06	.08	.06	.04	.05	.04
Organizational tenure	.00	.04	.04	.00	-.01	-.02	.20*	.20*	.20*	.18*	.17*	.17*
Employee telecommuting (Yes = 1; No = 0)		.15*						.16*				

*continued*

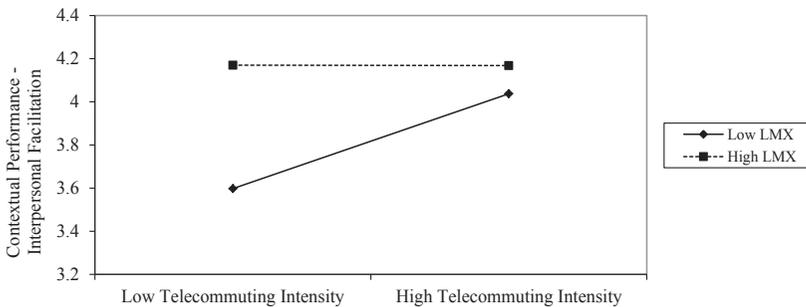
TABLE 3 (continued)

	Job dedication						Interpersonal facilitation					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI
Employee telecommuting intensity			.15*	.14	.22*	.26*			.16*	.09	.17	.16
LMX				.38**	.41**	.41**				.23*	.26*	.26*
Telecommuting normativeness				-.02	-.06	.02				.05	.02	-.01
Employee telecommuting intensity × LMX					-.21*	-.20*					-.21*	-.21*
Employee telecommuting intensity × LMX telecommuting normativeness						-.17						.05
<i>F</i>	1.06	1.12	1.11	2.47**	2.74**	2.72**	1.66	2.28*	1.86*	1.78*	2.06*	1.89*
<i>R</i> <sup>2</sup>	.06	.08	.08	.20	.24	.25	.10	.14	.12	.15	.19	.19
$\Delta R^2$	.06	.02*	.02*	.12**	.04**	.01	.10	.04*	.02*	.03*	.04*	.00
Adj. <i>R</i> <sup>2</sup>	.00	.01	.01	.12	.15	.16	.04	.08	.06	.07	.10	.09

Note. One-tailed test. <sup>a</sup>Tabled values are standardized regression weights.  $\Delta R^2$  Comparisons: Models II and III with I; Average listwise  $n = 128$  for models including manager source data.  
 \*  $p < .05$ . \*\*  $p < .01$ .



**Figure 3: Interaction Between Employee Telecommuting Intensity and LMX Predicting Contextual Performance–Job Dedication.**



**Figure 4: Interaction Between Employee Telecommuting Intensity and LMX Predicting Contextual Performance–Interpersonal Facilitation.**

positively associated with perceived autonomy (standardized  $\beta = .35$ ;  $p < .01$ ; Table 4, Model III).

Recall that Hypothesis 4a proposed that perceived autonomy would facilitate task and contextual performance. This hypothesis was strongly supported, with standardized  $\beta = .41$ ;  $p < .01$  for task performance (Table 5, Model II), standardized  $\beta = .30$ ;  $p < .01$  for job dedication, and standardized  $\beta = .26$ ;  $p < .01$  for interpersonal facilitation (see Table 6, Model II). Notably, perceived autonomy remained a significant predictor of task performance and job dedication in a full model that included all predictors indicated in Hypotheses 1, 2, and 5a (see Models III and IV in Tables 5 and 6). It also predicted interpersonal facilitation in the full model that included all hypothesized predictors.

Hypothesis 4b proposed that perceived autonomy would act as an intervening variable between telecommuting and task and contextual performance. To test this indirect effect, we obtained the 95% percentile

TABLE 4  
*Multiple Regression Results for the Test of Hypotheses 3a–b and 5c<sup>ab</sup>*

	Perceived autonomy				
	I	II	III	IV	V
Industry–transportation and trade	.02	.07	.04	.12	.13
Industry–services	–.05	–.01	–.05	.14	.14
Organization size	.02	–.02	–.01	–.06	–.06
Perceived organizational support	.14*	.09	.11	.24**	.24**
Occupational autonomy	.21**	.15**	.14*	.08	.04
Job interdependence	.04	.04	.07	.17*	.16*
Gender (M = 1; F = 0)	–.08	–.04	–.08	–.10	–.09
Organizational tenure	.03	.04	.05	.12	.11
Employee telecommuting (Yes = 1; No = 0)		.35**			
Employee telecommuting intensity			.35**	.29**	.35**
Telecommuting normativeness				.10	.21*
Employee telecommuting intensity × telecommuting normativeness					–.23*
<i>F</i>	3.85**	8.25**	8.39**	5.55**	5.62**
<i>R</i> <sup>2</sup>	.10	.20	.21	.33	.36
$\Delta R^2$	.10	.10**	.11**	.12 <sup>c</sup>	.03*
Adj. <i>R</i> <sup>2</sup>	.07	.18	.19	.27	.30

*Note.* One-tailed test. <sup>a</sup>Tabled values are standardized regression weights.  $\Delta R^2$  Comparisons: Models II and III with I; <sup>b</sup> Models I, II, and III use employee source data only; <sup>c</sup> models IV and V include manager source data, hence differences in *R*<sup>2</sup> between Model III and Model IV are not directly comparable. Average listwise *n* = 318 for models using employee source data and average listwise *n* = 128 for models including manager source data.

\**p* < .05. \*\**p* < .01.

bootstrap confidence intervals (CI) for the hypothesized indirect effects using 1,000 bootstrap samples (see MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008; Shrout & Bolger, 2002). To facilitate interpretation, we standardized all variables prior to conducting tests of the indirect effect. Our analyses suggest that telecommuting intensity had positive and significant (95% CI did not include zero) indirect effects on task performance [ $\beta = .15$ ; CI: (.08, .24)], job dedication [ $\beta = .09$ ; CI: (.02, .18)], and interpersonal facilitation [ $\beta = .06$ ; CI: (.02, .12)]. Preacher and Kelley (2011) recommend that researchers quantify the indirect effect by indexing it with respect to the maximum possible indirect effect, an

TABLE 5  
*Multiple Regression Results for Tests of Hypotheses 4a–b Involving Task Performance*<sup>a</sup>

	Task performance			
	I	II	III	IV
Industry–transportation and trade	.07	.04	–.13	–.12
Industry–services	.08	.03	–.10	–.11
Organization size	–.08	–.07	–.08	–.09
Perceived organizational support	–.01	–.14	–.17*	–.14
Occupational autonomy	.01	–.03	–.06	–.11
Job interdependence	.24*	.20*	.10	.11
Gender (M = 1; F = 0)	–.03	–.01	–.02	–.01
Organizational tenure	.06	.01	–.02	–.03
Perceived autonomy		.41**	.36**	.31**
Employee telecommuting intensity			–.02	.11
LMX			.40**	.44**
Telecommuting normativeness			.04	.09
Employee telecommuting intensity × LMX				–.17*
Employee telecommuting intensity × Telecommuting Normativeness			–.16	
<i>F</i>	1.03	3.39**	4.72**	4.65**
<i>R</i> <sup>2</sup>	.06	.20	.35	.39
$\Delta R^2$	.06	.14**	.15**	.04*
Adj. <i>R</i> <sup>2</sup>	.00	.14	.28	.31

Note. One-tailed test. <sup>a</sup>Tabled values are standardized regression weights. Average listwise  $n = 128$  for models including manager source data.

\* $p < .05$ . \*\*  $p < .01$ .

index they refer to as kappa square ( $\kappa^2$ ). The  $\kappa^2$  index for the indirect effect of telecommuting intensity on each of our three dependent variables was .16 for task performance, .09 for job dedication, and .10 for interpersonal facilitation. According to Preacher and Kelley (2011),  $\kappa^2$  ranging from .09 to .16 would indicate that indirect effects in our study can be characterized as medium sized.

Hypotheses 5a–b, which concerned the moderating effects of telecommuting normativeness, predicted that it would attenuate telecommuting intensity's positive effect on task (Hypothesis 5a) and contextual

TABLE 6  
Multiple Regression Results for Tests of Hypotheses 4a–b Involving Contextual Performance <sup>a</sup>

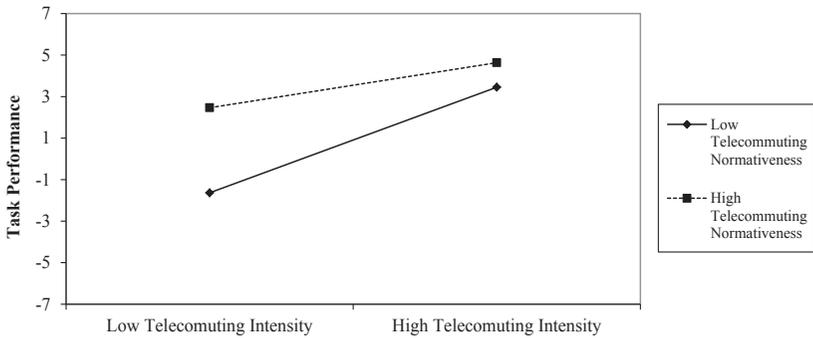
	Job dedication				Interpersonal facilitation			
	I	II	III	IV	I	II	III	IV
Industry–transportation and trade	-.16	-.18	-.26	-.27*	-.08	-.10	-.08	-.10
Industry–services	-.16	-.19	-.29*	-.32*	.00	-.03	-.01	-.04
Organization size	.04	.05	-.02	-.02	-.07	-.06	-.08	-.08
Perceived organizational support	.06	-.03	-.16	-.12	.14	.06	-.02	.02
Occupational autonomy	.08	.05	.01	-.04	-.04	-.06	-.05	-.07
Job interdependence	.16	.12	.05	.06	.21*	.18*	.06	.08
Gender (M = 1; F = 0)	.06	.07	.09	.09	.06	.07	.07	.06
Organizational tenure	.00	-.04	-.02	-.04	.18*	.15	.16	.15
Perceived autonomy		.30**	.27**	.24*		.26**	.21*	.21*

*continued*

TABLE 6 (continued)

	Job dedication				Interpersonal facilitation			
	I	II	III	IV	I	II	III	IV
Employee telecommuting intensity			.06	.18			.04	1.34*
LMX			.34**	.38**			.20*	.30**
Telecommuting normativeness			-.05	-.03			.03	-.07
Employee telecommuting intensity × LMX				-.19*				-1.33*
Employee telecommuting intensity × telecommuting normativeness				-.11				.10
<i>F</i>	1.06	2.13	2.97	2.98	2.18	2.96	1.98	2.06
<i>R</i> <sup>2</sup>	.06	.13	.25	.28	.12	.17	.18	.22
$\Delta R^2$	.06	.07**	.12**	.03*	.12	.05**	.01	.04*
Adj. <i>R</i> <sup>2</sup>	.00	.07	.17	.19	.07	.12	.09	.11

Note. One-tailed test. <sup>a</sup>Tabled values are standardized regression weights. Average listwise  $n = 128$  for models including manager source data.  
\*  $p < .05$ . \*\*  $p < .01$ .

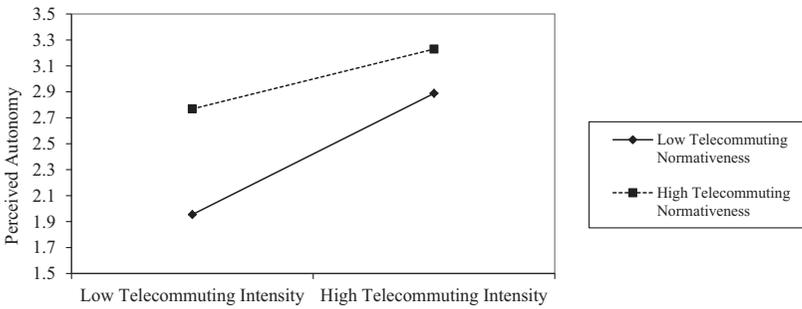


**Figure 5: Interaction Between Employee Telecommuting Intensity and Normativeness Predicting Task Performance.**

performance (Hypothesis 5b). Hypothesis 5a was supported—normativeness had a significant attenuating effect on the telecommuting intensity–task performance relationship; the coefficient of the interaction term was negative and significant (task performance:  $\beta = -.23, p < .05; \Delta R^2 = .03$ ; Table 2 Model VI). Plotting the interaction effect (see Figure 5) at high and low levels of the mean-centered interaction terms ( $\pm 1 SD$  above the mean) suggested that telecommuting intensity had no effect on task performance when normativeness was high. It had a significant positive effect on task performance when normativeness was low. Further, the interaction plot suggests that, across all levels of telecommuting intensity, task performance was higher when telecommuting normativeness was high compared to when it was low.

Hypothesis 5b was not supported. The coefficient of the interaction term for each of the two dimensions of contextual performance—job dedication (standardized  $\beta = -.17; ns.$ ) and interpersonal facilitation (standardized  $\beta = .05; ns.$ )—was not significant (see Table 3, Model VI, for each dependent variable). Finally, Hypothesis 5c, which predicted that telecommuting normativeness would attenuate the impact of telecommuting intensity on perceived autonomy, was consistent with our data. The telecommuting  $\times$  normativeness effect was negative and significant ( $\beta = -.23, p < .05$ ; Table 4 Model V)<sup>2</sup> and explained an additional 3% of the variance in perceived autonomy. We plotted the interaction effect at high and low levels of each variable ( $\pm 1 SD$  above and below the

<sup>2</sup>Arguments for Hypothesis 2 would suggest that LMX and telecommuting intensity could be considered as alternate ways to enhance perceived autonomy. To account for this possibility, we tested Hypotheses 4 and 5a–c after controlling for LMX. There were no substantive differences in the pattern or significance of results for these hypotheses before and after including LMX as a control.



**Figure 6: Interaction Between Employee Telecommuting Intensity and Normativeness Predicting Perceived Autonomy.**

mean; see Figure 6). As predicted, telecommuting normativeness *weakened* the employee telecommuting intensity–perceived autonomy relationship. Simple slope tests reveal that the effect of intensity on perceived autonomy relationship was steeper (more positive) when telecommuting normativeness was low ( $\beta = .06, p < .01$ ) than when it was high ( $\beta = .03, p < .05$ ). Similar to findings for Hypothesis 5a, employees experience higher levels of perceived autonomy across all levels of telecommuting intensity when telecommuting normativeness was high compared to when it was low. This hints at a positive main effect of telecommuting normativeness on perceived autonomy.

Finally, because our model treats perceived autonomy as an intervening variable between telecommuting (intensity) and its distal outcomes, it implies that the indirect effect of telecommuting on those outcomes is also attenuated by telecommuting normativeness. Moderated mediation tests of this possibility (Edwards & Lambert, 2007; Preacher, Rucker, & Hayes, 2007) demonstrated that the strength of the conditional indirect effect of employee telecommuting intensity on task performance and each of the two facets of contextual performance differs across levels of telecommuting normativeness. Supporting Hypothesis 3, we found evidence of a first-stage interactive effect (Edwards & Lambert, 2007), with task performance, interpersonal facilitation, and job dedication as dependent variables (see Table 7 for a summary). Examination of the conditional indirect effects using Edwards and Lambert's (2007) analytic procedures at low and high levels of telecommuting normativeness sheds more light on the nature of this first-stage interactive effect (see Table 7). The strength of the positive conditional indirect effect of employee telecommuting intensity on each of the three dependent variables—task performance, job dedication, and interpersonal facilitation—becomes progressively weaker as telecommuting normativeness increases from low to high. Further, percentile bootstrap confidence intervals with 1,000 resamples around the

TABLE 7  
*Results of Moderated Mediation Analyses*

<i>Dependent variable: Task performance</i>		Effect		
<i>Moderator</i>	First stage	Direct	Indirect	Total
<i>Dependent variable: Task performance</i>				
<i>Moderator</i>				
Telecommuting Normativeness				
Low	.51*	-.20	2.14*	1.94*
High	.29*	-.20	1.21*	1.01*
Differences	.22*		.93*	.93*
<i>Dependent variable: Contextual performance-job dedication</i>				
<i>Moderator</i>				
Telecommuting Normativeness				
Low	.51*	.04	.13*	.17*
High	.29*	.04	.07*	.11
Differences	.22*		.06*	.06*
<i>Dependent variable: Contextual performance-interpersonal facilitation</i>				
<i>Moderator</i>				
Telecommuting Normativeness				
Low	.51*	.04	.11*	.15*
High	.29*	.04	.06*	.10
Differences	.22*		.05*	.05*

*Note.* Tests of differences for the indirect and total effect were based on bootstrap percentile confidence intervals with 1,000 re-samples. Variables were standardized prior to calculation of indirect effects.

difference between indirect effects of telecommuting intensity at low and high levels of telecommuting normativeness on each of the three criteria also did not include zero. Taken together, these results suggest that telecommuting's indirect effect on task and contextual performance is lessened as normativeness increases. This is consistent with the ideas that, when coworkers and/or one's supervisor telecommute, it reduces the "specialness" of the *i-deal* and, therefore, reduces its motivational impact.

### *Discussion*

Does use of virtual work arrangements such as telecommuting that constitute an *i-deal* reduce employee task and contextual performance? After controlling for several relevant confounds, our findings suggest that *telecommuting has beneficial associations with task and contextual performance*. The former finding is consistent with a tentative result put forward by Gajendran and Harrison (2007). The latter findings (for both job dedication and interpersonal facilitation) are new to the HR literature, and they counter some of the public rhetoric and implicit theories offered by

visible executives (Swisher, 2013; Welch & Welch, 2007). Further, these positive effects on individual effectiveness were contingent on supervisor–subordinate relationship quality and normativeness in an interesting way. Telecommuting intensity’s associations with task and contextual performance ranged from benign (when LMX is high) to positive (when LMX is low). Similarly, telecommuting intensity had stronger associations with task performance (but not contextual performance) when normativeness was low compared to when it was high. In addition, the findings also suggest that much of telecommuting’s impact was transmitted via the perceived autonomy that such virtual work arrangements conveyed. Although normativeness moderated this indirect effect, it remained positive and significant across the range of values of the moderator in our data. Overall, alleviating widespread managerial concerns, results suggest that telecommuting does not impose significant performance and citizenship costs; in contrast, they suggest it has advantages for both of these criterion domains.

#### *Implications for Theory and Research*

Despite studying the same phenomenon, research on i-deals and research conceptualizing telecommuting as an instance of enhancing the R side of the JD-R equation have proceeded along independent lines of inquiry. A key contribution of our study is to bring together these streams of research in a conceptual model that examines telecommuting’s influence on prominent individual criterion performance. Telecommuting’s beneficial associations with task and contextual performance unfolded via two distinct yet complementary paths. Results from tests of the first path, based on predictions from i-deals theory (Rousseau, 2005), indicate that telecommuting’s effects are positive overall. However, plotting LMX’s significant moderating influence for each of the three criteria—task performance, job dedication, and interpersonal facilitation (see Figures 2–4)—provides further insight. *Telecommuting intensity had significant and positive associations with all three dependent variables when LMX was low.* It had no discernible effect on any of these outcomes when LMX was high. Of note, high LMX employees were engaged in elevated levels of task and contextual performance regardless of being involved in telecommuting. Still, for managers concerned about telecommuting’s performance and citizenship impacts, these results suggest that providing high LMX employees access to telecommuting or increasing its extensiveness is unlikely to harm their already up-raised effectiveness. Crucially, for low LMX employees, telecommuting provides managers an important lever for enhancing effectiveness.

Results from tests of the second path, based on prior research linking telecommuting to greater feelings of control over work (e.g., Allen et al., 2003), suggest that *telecommuting was indirectly associated with task performance and both dimensions of contextual performance via perceived autonomy*. This affirms predictions based on insights from the JD-R model (Demerouti et al., 2001) and resource theory (Edwards & Rothbard, 2000) that conceptualize autonomy as a valuable job resource that is reinvested by employees in the work domain. Thus, an additional contribution of our study lies in appropriating insights from the JD-R model and COR principles themselves for explaining telecommuting's impact on task and contextual performance.<sup>3</sup> Although prior research has linked telecommuting to perceived autonomy, little theory exists about the downstream consequences of this relationship, especially for performance outcomes. Applying the JD-R model suggests that telecommuting is instrumental for generating a critical job resource: employee experience of control over their work environments. Critically, COR principles (Hobfoll, 2001) that underlie the JD-R model suggest that autonomy from telecommuting is more likely to be used toward task and contextual performance.

Finally, findings also provide insight about the role of telecommuting normativeness. When normativeness is high, the distinctiveness of telecommuting as an i-deal is diminished, which we predicted would mean it is less likely to lead to improved task or contextual performance (Hypothesis 5a–b). The results partly supported this expectation. Telecommuting intensity had a positive association with task performance when telecommuting normativeness was low (and therefore the telecommuting i-deal was socially distinctive) but had no effect when it was high. However, normativeness had no significant moderating effect on telecommuting intensity's associations with either dimension of contextual performance. Perhaps telecommuting's nonnormative status motivates telecommuters to prioritize core dimensions of performance over more discretionary contextual performance behaviors to proactively minimize supervisory concerns about slacking off when out of sight.

Normativeness also influenced how much autonomy employees experienced from telecommuting. Employees benefitted more readily from telecommuting when normativeness was low (when the telecommuter was unique in the workgroup) rather than high (when colleagues and/or their supervisor also telecommuted). Further, normativeness attenuated the indirect associations of telecommuting on task and contextual performance via perceived autonomy. The indirect effect on each of these outcomes was stronger when normativeness was low versus high. This

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<sup>3</sup>We are grateful to an anonymous reviewer for suggesting this.

result conforms to predictions of social information processing theory (Salancik & Pfeffer, 1978). Of note, an interesting and unanticipated nuance was a positive main effect for normativeness on perceived autonomy (see Figure 5). When normativeness was high, perceived autonomy was also higher on average across different levels of employee telecommuting intensity as opposed to when it was low. The large and significant bivariate correlation between the two variables ( $r = .52, p < .01$ ) supports our speculation.

More broadly, our study advances theory by focusing attention on the social context surrounding virtual work arrangements. Although research has investigated the social consequences of virtual work (e.g., Bartel, Wrzesniewski, & Wiesenfeld, 2012; McCloskey & Igbaria, 2003), the social context of telecommuting has generally been treated as invariant. By investigating the impact of LMX and workgroup telecommuting normativeness, our study is among a small set of studies that not only question this assumption of a static social context but also accords it causal potency in influencing outcomes from virtual work (e.g., Bélanger, Watson-Manheim, & Swan, 2013; Gajendran & Joshi, 2012; Golden, 2007; Golden & Veiga, 2008).

### *Practical Implications*

Managers of prospective telecommuters often worry that telecommuting may hurt job performance or that it may hinder availability to others and increase the workloads of office-based employees (Linkow, Civian, & Lingle, 2011). When managers view employee telecommuting as primarily a personal life accommodation that imposes organizational costs, they are likely to question employees' commitment and job dedication (Leslie et al., 2012). Our study's findings provide alternative frames and different attributions for viewing telecommuting. Managers can treat telecommuting as an i-deal that is mutually beneficial to the employee and the organization and as a form of work redesign that generates autonomy perceptions, a valuable job resource that could improve employee productivity and contextual performance.

These findings also highlight the need for formal organizational policies with explicit guidelines about employee eligibility for telecommuting. In the absence of such policies, it is likely that managers may provide i-deals only to high LMX subordinates, those whom they trust and believe as worthy of receiving special privileges. In light of evidence from our study suggesting that telecommuting is likely to enhance the task and contextual performance of low LMX subordinates, eligibility policies may need to be designed to ensure that low LMX employees also have the

opportunity to access virtual work arrangements. In addition, organizations where telecommuting is offered as a special perquisite to a privileged few appear to reap the greatest benefits in the task domain through improved performance. Of note, when telecommuting is normative, it does not hurt task performance.

### *Limitations*

Despite methodological strengths such as multisource data from a wide variety of organizations collected at different time points, our study has several limitations. Data on telecommuting and perceived autonomy were collected at the same time from the same source, which limits our ability to make causal claims about the connection between the two. Still, the significant interaction effect between telecommuting intensity and normativeness predicting perceived autonomy reduces concerns about common methods bias (Siemsen, Roth, & Oliveira, 2010). Likewise, we cannot rule out the possibility of reverse causation as an explanation for telecommuting's associations with improved task or contextual performance; it is possible that only those who display high levels of task or contextual performance are allowed to telecommute. Future research should use longitudinal designs to provide more robust causal evidence about telecommuting's effects on task and contextual performance.

Another limitation of our study is that the coefficient alpha for several measures (normativeness, task performance, and LMX) did not exceed .80, a matter of concern especially for established scales (Lance, Butts, & Michels, 2006; Nunnally, 1978). As Lance et al. (2006) highlight, although it is possible to correct for attenuation when using low reliability measures, it is not a substitute for low-quality measures. Therefore, future research should replicate our findings using alternate measures of LMX and task performance and measure telecommuting normativeness with more than two items to improve reliability. Finally, despite sampling from a wide variety of industries and organizations, our measure of LMX had relatively low variance. Substantively, this range restriction on our LMX measure makes it harder to detect moderation effects, which implies that our study provides a conservative test of Hypothesis 2. Future research, such as a multifirm design that follows recent graduates into the workforce, could capture a greater range of LMX.

### *Conclusion*

Our study's findings alleviate concerns that telecommuting imposes performance and social costs while providing employees with

significant personal benefits. Instead, they suggest that telecommuting is associated with improved task and contextual performance. Mitigating worries that telecommuting imposes collective hardships, our study suggests that telecommuting under some circumstances can contribute to *enhancing* the social environment of work. Crucially, the damaging effects anticipated by managers of prospective telecommuters have not been realized in broadly sampled work arrangements.

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## Appendix A

We took several steps to ensure that only full-time employees participated and to minimize the possibility of fraudulent responses by students. All students were offered an alternative assignment to earn extra credit that was equivalent in terms of time and effort. Further, the survey contained check questions based on course materials that would be possibly meaningful to students but irrelevant to employees and supervisors, which could help detect potential fraud. No respondent endorsed that they were knowledgeable about the concepts included on these check questions. To further authenticate survey responses, we also asked respondents for their specific job titles and a brief description of the mission of their organization. They were also encouraged to provide their work email address for receiving gift certificates. Of the 323 respondents, 224 provided work e-mails for gift certificates. Finally, we personally contacted a random sample of employees and their supervisors to verify their full-time employee status and their actual participation in the survey. Everyone who we contacted could verify their participation as well as their job or position in their current firm, as matched to the survey response.

## Appendix B

*Items Measuring Perceived Autonomy*

- (1) To what extent are you able to act independently of your supervisor in deciding your place of work?
- (2) To what extent are you able to define your work location independently of others?
- (3) How much discretion can you exercise in deciding where you work?
- (4) How much discretion can you exercise in defining your work schedule?
- (5) To what extent are you able to act independently of your supervisor in defining your work schedule?
- (6) To what extent are you able to define your work schedule independently of others?

(Rated on a 5-point scale: 1 = *very little* to 5 = *very much*)

Adapted from: Job Characteristics Inventory, Sims, Szilagyi, & Keller (1976)