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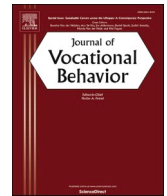
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Staying in the loop: Is constant connectivity to work good or bad for work performance?

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ABSTRACT

This study addressed the question of how two sides of being constantly connected to work (i.e., availability and interruptions) affect work performance. Applying Self-Determination Theory's (SDT) three basic human needs to the communication realm, we examine how being available for others versus being interrupted by others affects feelings of communication control (autonomy), communication effectiveness (competence), and social support given to and received from co-workers (relatedness). In turn, we examine how availability and interruptions relate to work performance through those three mechanisms. The results of Study 1, a five-day diary study among 317 employees ($n = 1135$ days) show that daily availability is positively related to work performance through higher levels of communication effectiveness. Daily interruptions are directly negatively related to work performance. Whereas daily availability is positively related to experienced communication control, daily interruptions undermine feelings of control. Study 2, a five-day diary study among 72 employees ($n = 324$ days) replicates those findings. The two studies further reveal that on days on which employees are more available they provide more emotional support, and they receive more instrumental support from coworkers. On days with more interruptions, employees provide more instrumental support to colleagues. The findings advance theory by applying insights from SDT to the organizational communication literature, developing and testing a model that explains why constant connectivity has pros and cons for work performance.

1. Introduction

New media technology enables employees to develop intense patterns of communication, often resulting in being connected to work 24/7 (Mazmanian, 2013; Perlow, 2012; Wajcman & Rose, 2011). Connectivity is defined as the mechanisms, processes, systems and relationships that link individuals and collectives (e.g. groups, organizations, cultures, societies) by facilitating material, informational and/or social exchange (Kolb et al., 2012). The literature on connectivity generally shows a paradox in the impact of increased connectivity on employees and organizations (Sonnentag et al., 2018). On the one hand, the advantages of increased connectivity include a faster work pace (Cavazotte et al., 2014; Chesley, 2010), knowledge sharing (Choi et al., 2010), and high work engagement (Ter Hoeven et al., 2016). On the other hand, various downsides of constant connectivity have been reported, including

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more stress, anger, and work-life conflict (Barley et al., 2011; Butts et al., 2015; Āuranova & Ohly, 2016), as well as reduced time to recover from work (Barber & Jenkins, 2014; Barber & Santuzzi, 2015; Cole, 2016).

In the communication literature, the opposing features of constant connectivity have often been ascribed to the autonomy paradox (Mazmanian, 2013; Mazmanian et al., 2013; Putnam et al., 2014). In short, the autonomy paradox explains that on the one hand, being able to connect to work anytime, anywhere, increases feelings of autonomy. Individually, employees supported by new media technology (e.g., email, messaging) feel that they can decide when they are available for others and believe that their availability helps them to stay on top of their work (Mazmanian et al., 2013). At the collective level, however, increased connectivity leads to more incoming messages for everyone, causing interruptions (Barley et al., 2011), which diminishes feelings of autonomy. Recently, Day et al. (2019) identified two additional paradoxes of continuous connectivity due to Information Communication Technology (ICT) use: the productivity paradox and the social connectivity paradox. The productivity paradox describes how being connected to work through ICT facilitates fast and effective communication, thereby enabling employees to work more efficiently. On the other hand, incoming messages and interruptions lower productivity because employees are overloaded with information, which not only is a risk for communication quality (e.g., miscommunication or missing messages), but also increases time required to process information and to respond to messages. The social connectivity paradox suggests that being connected to others through electronic communication might reduce feelings of isolation and fosters cooperation among coworkers (Day et al., 2019). The other side of the coin, however, is that ongoing communication throughout the day might feel as an intrusion, triggering negative emotions or misunderstandings (Puranik et al., 2020), thereby undermining relationships with others at work.

Whereas the implications of constant connectivity for employee well-being have been well-documented (Buchler et al., 2020; Day et al., 2012; Ten Brummelhuis et al., 2012), the opposing implications of being constantly connected to work make it theoretically difficult to predict what the eventual impact on work performance is. This question is, however, particularly relevant for organizations since employee performance has strong financial implications for organizations (Huselid, 1995). Based on insights from the three paradoxes, we suggest that the advantages of constant connectivity (enhanced control, efficiency, and cooperation) are due to employees' availability for others, whereas the pitfalls of constant connectivity (reduced control, inefficiency, and impaired relationships) are caused by the interruptions that are inherent to being connected via new media technology. Accordingly, we distinguish between two sides of constant connectivity – availability and interruptions, with the goal to examine their effects on work performance. We define availability as an active communication style whereby employees are accessible for others at work and respond to messages in a timely manner. Interruptions are defined as “synchronous interactions which are not initiated by the recipient, are unscheduled, and result in the recipient discontinuing their current activity” (Rennecker & Godwin, 2005, p. 250).

In line with the three paradoxes described by Day et al., (2019), we use Self-Determination Theory (SDT; Ryan & Deci, 2000; Van den Broeck et al., 2016) as our guiding framework and examine how availability and interruptions affect employees' needs for autonomy, competence, and relatedness. More specifically, we apply SDT's insights to a communication context that fits with the three ICT paradoxes (Day et al., 2019) and examine how availability and interruptions affect work performance through their impact on communication control, communication effectiveness, and social support between coworkers. We test the proposed model (Fig. 1) in two five-day diary studies. A daily diary design captures fluctuating (i.e., availability) or episodic events (i.e., interruptions) and is thus particularly suitable to examine how availability and interruptions, which may fluctuate between days, affect daily performance.

Our study contributes to the literature in three ways. First, we complement previous research that examined the well-being implications of connectivity (Buchler et al., 2020; Day et al., 2012; Ter Hoeven et al., 2016) with insights on the relation between connectivity and employee performance. Whereas various *qualitative* studies have asked employees if and how being connected to work through new media technologies helps them to be more effective at work (Cavazotte et al., 2014; Matusik & Mickel, 2011; Mazmanian et al., 2013), very little is known about the *quantitatively measured* impact of constant connectivity on work performance. Our study fills this gap by examining how two sides of constant connectivity (availability and interruptions) relate to work performance, thereby continuing the line of research that examines positive and negative implications of constant connectivity (Sonnentag et al., 2018). Such insights are key to employees and employers who seek to maximize the benefits of connectivity for work, while limiting its possible downsides.

Second, we expand and test the theoretical underpinnings of why constant connectivity might have both positive and negative effects on work performance. The autonomy paradox has been described in various qualitative studies (Cavazotte et al., 2014; Leonardi

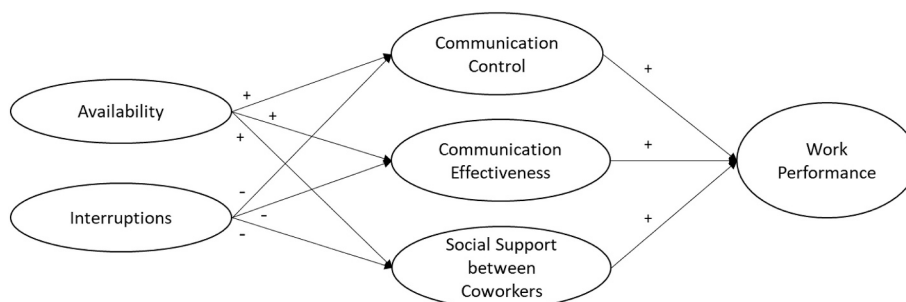


Fig. 1. Hypothesized model.

Note. All relationships were tested at the within-level (comparing days).

et al., 2010; Matusik & Mickel, 2011; Mazmanian, 2013; Mazmanian et al., 2013). However, its main assumption – that constant connectivity has two sides that are differently related to feelings of autonomy – has, to our knowledge, not yet been tested quantitatively. Similarly, we hope to contribute to the literature by testing the conceptually proposed productivity paradox and social connectivity paradox (Day et al., 2019) as mechanisms that explain why constant connectivity has opposing effects on work performance. Building on this conceptual work, we develop and test a model that specifies that availability can foster, whereas interruptions undermine feelings of autonomy (i.e., communication control), competence (i.e., communication effectiveness) and relatedness at work (i.e., social support given to and received from coworkers), thereby explaining the paradoxical implications of connectivity.

Finally, from a methodological standpoint, we solidify our contributions by using daily diary studies. Diary designs capture “life as it is lived” considering daily variability in employees’ work experiences (Bolger et al., 2003). Diary studies allow for within-person comparisons and enable us to examine whether daily differences in connectivity explain why work outcomes of the same person are higher on some days than on others. This approach is particularly important because connectivity might differ per day (e.g., a day with scheduled meetings versus an ‘off the grid’ day during a work trip), and hence, feelings of control (Mazmanian et al., 2013), communication effectiveness, social support given to coworkers, and work performance may fluctuate between days. This approach fits with the recent trend in the OB literature to examine organizational phenomena at smaller units of analysis (Christian et al., 2015; Dalal et al., 2014; Parker, 2014), as those smaller units of analysis do justice to what happens in daily life.

2. Theoretical framework

2.1. Self-determination theory in a communication context

The three ICT paradoxes as described by Day et al. (2019) are grounded in Self-Determination Theory (SDT) as each paradox explains how ICT use affects the three needs that are central in this theory. Before discussing the three paradoxes in detail, we explain how the core tenets of SDT can be applied to a communication context. SDT is one of the most influential theories on human motivation, well-being and performance (Van den Broeck, Vansteenkiste, & De Witte, 2008) and posits that individuals thrive in environments that enable them to satisfy three basic human needs: autonomy, competence, and relatedness (Ryan & Deci, 2000). Autonomy refers to acting with a sense of choice and volition such that one is in control over one’s actions and feels psychologically free (Van den Broeck et al., 2008). Competence is conceptualized as having the capabilities to master an environment and bring about desired outcomes (Deci & Ryan, 2000; Van den Broeck, Vansteenkiste, & De Witte, 2008). Relatedness represents connectedness to others such that one loves and cares for others and feels loved and cared for by others (Baumeister & Leary, 1995; Deci & Ryan, 2000; Van den Broeck et al., 2016).

Day et al. (2019) developed the three paradoxes to explain how ICT use positively and negatively affects employee well-being. We extend this line of reasoning to employee performance since SDT describes how the fulfillment of needs not only improves well-being but also can be used to the betterment of task or role performance (Van den Broeck et al., 2008; Ryan & Deci, 2000). To understand how connectivity might affect the three needs, we differentiate between two sides of connectivity – availability and interruptions –, thereby identifying which part of connectivity might be beneficial versus harmful for need fulfillment. In addition, we use a communication lens, explaining how availability and interruptions affect the three needs in the realm of communication. More specifically, we zoom in on the communication consequences of availability and interruptions, arguing that availability and interruptions have an impact on communication control, communication effectiveness, and social support given to and received from colleagues. Communication control is a specific form of autonomy (Day et al., 2012) and is indicative of how much autonomy employees experience in their communication at work. Communication effectiveness focuses on the competence employees experience regarding communication; if communication quality deteriorates (e.g., slow communication with delays and miscommunication) employees might not only feel less competent in communication, but about their ability to adequately complete their work tasks in general (Day et al., 2019). Finally, giving and receiving emotional and instrumental support to and from coworkers is indicative of how much they care for and are cared for by others (Ten Brummelhuis & Greenhaus, 2018), and thus captures employees’ relatedness in a work setting.

2.2. The autonomy paradox

Various qualitative studies (e.g., Cavazotte et al., 2014; Leonardi et al., 2010; Matusik & Mickel, 2011; Mazmanian, 2013; Mazmanian et al., 2013) have eloquently described the autonomy paradox. Based on experiences from employees, these studies explain that on the one hand, new media technologies give employees more flexibility and feelings of autonomy. For instance, due to the use of smartphones, employees can decide when they send emails and from what location they join a conference call. Employees feel it is their own decision to increase availability because it helps them to stay on top of their work – a clean inbox gives peace of mind – and to meet the requirements of today’s professionals – being always available (Mazmanian et al., 2013).

Of particular importance for the increased experienced autonomy due to enhanced connectivity are what Mazmanian et al. (2013) labeled as buffered availability, temporal distancing, and controlling communication, all enabled by the asynchrony of new media technology (i.e., email on a smartphone). Buffered availability means that employees keep track of incoming emails and monitor which emails are urgent or important. This monitoring behavior makes them feel in control because they are kept informed, and they can decide to act immediately to urgent messages, or later if messages are not urgent. Temporal distancing is related to this and refers to the option that email provides, unlike incoming phone calls or face-to-face meetings, to switch off temporarily and reply to messages at a more convenient time. Finally, controlling communication refers to the increased flexibility to send messages at different times and places, thereby enabling employees to use their time more efficiently (e.g., sending emails during a commute on the train). Due to

buffered availability, temporal distancing, and controlling communication, employees can make themselves available while feeling more in control over their work communication, even when they spend more time on email, and are online incessantly.

The flipside of constant connectivity is that responsive employees generate increased communication flows, thereby undermining the control that they thought to obtain when they started using new media technology. Employees who are continuously connected to work are often interrupted by incoming messages, feel overwhelmed by incoming email, and feel pressured to immediately respond to messages (Leonardi et al., 2010; Mazmanian et al., 2013; Perlow, 2012). In their study on distributed work arrangements, Leonardi et al. (2010) interviewed teleworkers who described the paradoxical effects of new media technology use. Teleworkers felt that the same technology that facilitated the possibility to work outside of the office, increasing control over their workday, simultaneously caused them to feel overly connected to others in the organization, corroding control. In her study at the Boston Consulting group, Perlow (2012) found similar results and referred to this phenomenon as the “cycle of responsiveness” (p. 7): As employees incorporate various communication media into their work routine, their colleagues may perceive them as more available and contact them more often, resulting in more interruptions throughout the day.

The autonomy paradox thus suggests that continual connectivity has two sides that impact feelings of autonomy; whereas being available for others fosters a sense of autonomy at work, interruptions due to incoming communication undermine feelings of autonomy at work. Note that the autonomy paradox describes how constant connectivity affects *job* autonomy, an umbrella term for autonomy over content, timing, locations, and performance of activities (Mazmanian et al., 2013), or speaks in general of control over the workday (Leonardi et al., 2010). Our focus on availability and interruptions as two implications of connectivity enables us to pinpoint one specific form of autonomy at work that is affected. Availability is tied to communication, as the mechanisms buffered availability, temporal distancing, and controlling communication, describe the level of control employees experience over communication for work. Similarly, interruptions are directly tied to communication, as unscheduled interactions that are not initiated by the employee erode the employee’s control over communication. We therefore expect that availability and interruptions affect employees experienced *communication* control, which refers to the employee’s ability to influence the timing of incoming and out-going work-related communication (e.g., e-mail, texts, instant messages, phone calls, conference calls).

Hypothesis 1. Whereas (a) daily availability is positively related to daily communication control, (b) daily interruptions are negatively related to communication control.

2.3. The productivity paradox

The productivity paradox describes how a similar friction between enabling and restricting features of constant connectivity affects employees’ work productivity. Having quick access to colleagues through various communication channels might speed up the work process (Cavazotte et al., 2014; Chesley, 2010) as it enhances knowledge sharing (Choi et al., 2010) and reduces delays (Rennecker & Godwin, 2005). The use of new media technology for work thus enhances communication effectiveness (i.e., whether communication efficiently and effectively contributes to the achievement of work goals), because an employee can quickly contact peers to pass on information (e.g., through instant messaging or email), thereby avoiding delays and time needed to get together for a face-to-face meeting (Cavazotte et al., 2014; Chesley, 2010; Matusik & Mickel, 2011; Ter Hoeven et al., 2016).

The flipside of this fast-paced communication is that employees receive more incoming messages and therefore are more frequently interrupted. In a study by Fonner and Roloff (2012), interviewees working remotely reported an increase in interruptions that made it hard to focus on the task at hand. Frequent interruptions may not only hinder working on a current task but may also impair the communication effectiveness during the interruption. Since interruptions are per definition unscheduled and result in the recipient discontinuing their current activity (Rennecker & Godwin, 2005), attention for the interrupting message is lower because the employee is still partially focused on the interrupted task (Leroy & Glomb, 2018). This attention residue on the interrupted task reduces the attentional resources available for the interruption (Puranik et al., 2020). As a result, communication effectiveness is lower during an interruption than in a situation in which an employee can schedule the interaction and prepare for its content.

In addition, if interruptions are frequent and ongoing, employees may experience information overload (Day et al., 2012). Information overload hampers productivity because it takes time to process incoming messages and respond to them (Day et al., 2019). Moreover, if incoming messages exceed the employees’ capacity to respond to each of them, they will either need to select to which messages to respond, or reduce time spent on each reply. Either strategy results in impaired communication effectiveness as messages may be left unanswered or errors may be made in quick responses. Research has further shown that employees who are overwhelmed by email and other incoming communication experience higher levels of stress (Day et al., 2012), and stress may further reduce the quality of communication as it can impair energy levels, memory retrieval, and judgement (Hobfoll, 2002; Starcke & Brand, 2012; Wolf, 2009).

Although the productivity paradox (Day et al., 2019) describes several processes that explain why constant connectivity might contribute to or undermine the work process (e.g., getting tasks done faster, or instigating more stress), we focus in particular on the implications of the two sides of connectivity for communication effectiveness at work. In line with above’s logic to focus on communication control, a narrower focus helps to get a better, more specific understanding of one of the possible processes by which availability and interruptions affect work performance. Since interruptions and availability are inherently tied to communication (Rennecker & Godwin, 2005; Ten Brummelhuis et al., 2012), we use a communication lens to understand the connectivity paradoxes better. Supported by the above empirical studies (e.g., Day et al., 2012; Fonner & Roloff, 2012; Leroy & Glomb, 2018; Puranik et al., 2020), we expect that availability and interruptions particularly affect productivity through their impact on communication effectiveness. Employees who make themselves available are more likely to exchange messages effectively and efficiently with others,

whereas employees who are frequently interrupted are more likely to experience communication as ineffective and inefficient.

Hypothesis 2. Whereas (a) daily availability is positively related to daily communication effectiveness, (b) interruptions are negatively related to communication effectiveness.

2.4. The social connectivity paradox

Constant connectivity caused by ICT use also has beneficial and harmful consequences for relationships at work. The dual implications of constant connectivity for how much relatedness employees experience is referred to as the social connectivity paradox (Day et al., 2019). On the one hand, access to faster and more advanced communication channels (e.g., video conferences, messaging) facilitates connections between employees. For instance, the threshold to send a message or email to a coworker, thereby creating a connection, might be lower than stopping by for an in-person conversation. Sometimes in-person conversations are not even possible (e.g., when a coworker works at a different site) and connections can now be made through online communication. Research indeed confirms that some individuals feel closer to others when they use new media technology because they can reach them anytime, anywhere, thereby creating a psychological neighborhood and symbolic proximity (O'Leary et al., 2014; Wei & Lo, 2006).

Other studies add that ICT enables the exchange of information, advice, and support (Choi et al., 2010; Collins et al., 2016), facilitating the development of rewarding relationships that are characterized by trust and mutual support (Cropanzano & Mitchell, 2005). We therefore expect that employees who are available for coworkers through new media technology create more opportunities to provide social support. Sending an email to colleagues or responding to a missed phone call helps create a personal connection, showing care for and interest in a peer (i.e., emotional support), while at the same time offering an opportunity to give advice on or help with a work problem (i.e., instrumental support). Similarly, reaching out to others in the workplace creates a moment in which social support can be received. Employees may contact their supervisor because they are looking for encouragement, or further instructions for a task.

The social connectivity paradox also describes the other side, however, and acknowledges that not all connections contribute to more feelings of relatedness (Day et al., 2019). In some instances, employees might experience too much connectivity because coworkers, clients, or supervisors can contact them anytime, anywhere (Van Laethem et al., 2018). Unexpected social interruptions – intrusions – are taxing interpersonal demands and go together with higher stress levels (Lin et al., 2013). A recent review of work interruptions adds that interruptions can elicit negative affect and job frustration, and consume self-regulatory resources (Puranik et al., 2020). Interruptions might therefore unintentionally create a hostile environment in which the interrupted (and irritated) employee is less open to providing or receiving social support (Brief & Motowidlo, 1986; Clark & Isen, 1982). For instance, an employee who is anxiously working on an important deadline might not be pleased if a coworker texts to exchange pleasantries, and thus cuts the conversation short. Similarly, when a client interrupts this busy employee with a request per email, s/he might give a minimal response because s/he is frustrated by the unfortunate timing, or simply because s/he has not enough energy to adequately deal with the request.

Based on insights from the social connectivity paradox and supporting empirical evidence (e.g., Collins et al., 2016; Puranik et al., 2020), we expect that availability opens up opportunities for giving and receiving social support in the workplace, whereas interruptions curtail such positive interactions. As previous research has revealed implications of constant connectivity for personal connections (Cooper & Kurland, 2002; Wei & Lo, 2006), collaboration (Choi et al., 2010; Moser & Axtell, 2013), or both (e.g., Collins et al., 2016), we examine how availability and interruptions relate to the provision and reception of emotional support (e.g., showing interest and care) and instrumental support (e.g., helping with a task), together also referred to as social support (House, 1981).

Hypothesis 3. Whereas (a) daily availability is positively related to daily social support between coworkers, (b) daily interruptions are negatively related to daily social support between coworkers.

2.5. Connectivity and daily performance

According to SDT, individuals who experience need satisfaction of all three needs are more likely to thrive – experiencing well-being and reaching their potential (Deci & Ryan, 2000). Each fulfilled need (e.g., close friendships, or being good at something) is directly beneficial as needs are linked to positive feelings such as high positive affect and low anxiety that contribute to well-being and psychological growth, and set up individuals for success in their tasks or roles (Vallerand, 1997; Van den Broeck et al., 2016). Moreover, when individuals feel control over their tasks, they feel more responsible for the outcome and are more persistent in reaching goals, which increases the chance of successful performance (Vallerand, 1997). Similarly, feeling confident about one's competence in a task (e.g., self-efficacy) enhances the chance of successfully completing the task (Hardre, 2003). And if individuals feel related to others, their anxiety decreases and self-esteem increases, which fosters task performance (Deci & Ryan, 2000; Ilardi et al., 1993).

As argued above, we expect that availability puts employees in a better position to experience autonomy, competence, and relatedness in their communication for work, whereas interruptions frustrate communication control, communication effectiveness, and social support given to and received from coworkers. Although there is limited research on the effect of communication control on performance, research on job autonomy systematically shows a positive relationship between job autonomy and work performance (Morgeson et al., 2005). Similarly, a positive relationship between communication effectiveness and work performance has been documented (González-Romá & Hernández, 2014; Snyder & Morris, 1984). Research on social support also generally supports the positive influence of social support exchanged between coworkers on their work performance (Beehr et al., 2000; Nagami et al., 2010).

Based on insights from SDT and empirical evidence on the beneficial impact of the three basic needs, we expect a positive relationship between communication control, communication effectiveness and social support at work on the one hand, and work performance on the other hand. This implies that the indirect effects of availability on performance, through the three mediators, are positive, whereas interruptions are negatively related to work performance as they hinder communication control, communication effectiveness and social support between coworkers.

Hypothesis 4. Whereas (a) daily availability is positively related to daily work performance through increased communication control, (b) daily interruptions are negatively related to daily work performance through reduced communication control.

Hypothesis 5. Whereas (a) daily availability is positively related to daily work performance through increased communication effectiveness, (b) daily interruptions are negatively related to daily work performance through reduced communication effectiveness.

Hypothesis 6. Whereas (a) daily availability is positively related to daily work performance through increased social support between coworkers, (b) daily interruptions are negatively related to daily work performance through reduced social support between coworkers.

3. Study 1: Methods

3.1. Sample and procedure

Master students at a university in the North Western region of the Netherlands recruited employees in their network willing to participate in this study. Data were collected from employees over a one-workweek period using daily surveys. Participants had to work at least 20 h per week and work in an organization with a minimum size of twenty employees. In addition, their job had to allow them some flexibility, in the sense that they could sometimes choose where, when, and/or how to work. In total, 436 employees were contacted from a variety of occupations working for different organizations (for the advantages of these types of samples see: Demerouti & Rispens, 2014; Wheeler et al., 2014). Of these, 299 employees participated in the general survey (response rate = 68.6%) and 317 employees participated in the daily-survey study (response rate = 72.5%).

The week prior to data collection, respondents were informed about the purpose and procedure of the study by email, emphasizing its voluntary basis and guaranteeing anonymity. At the beginning of the week, employees received a general online survey with questions about their demographic characteristics. At the end of each of the subsequent five workdays (Monday to Friday) at 5 pm, participants received an email with a link to a diary survey that included questions about their availability that day, experienced interruptions, communication control, communication effectiveness, support provided to coworkers, and work performance. Participants were asked to fill out the daily survey after they finished their work. If they had not worked that day, they could indicate so in the survey. Later in the evening, daily reminders were sent out. The diary survey among 317 employees resulted in 1135 daily cases that were completed in the correct time slot (Monday $N = 282$, Tuesday $N = 255$, Wednesday $N = 217$, Thursday $N = 210$, Friday $N = 171$).

Of the 299 employees who filled out the general survey, 150 (50.2%) were female. Participants had on average 13.5 years of work experience ($SD = 11.9$) and a mean age of 36.6 ($SD = 12.2$). Most employees were cohabiting with their partner (63.2%) and 41.5% of the respondents had children. Most respondents had completed a bachelor's degree (39.5%) or a master's degree (37.1%); the remainder completed high school or a vocational education. Respondents' mean weekly contractual work hours were 33.3 h ($SD = 9.8$), whereas their actual reported weekly hours were 37.8 h ($SD = 10.0$). Respondents worked in a broad range of sectors, including professional services (24.8%), governmental organizations (9.7%), and healthcare (9.4%).

3.2. Measures

Unless otherwise indicated, a five-point response scale was used, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). All measures were at the daily level.

3.2.1. Work performance

Work performance is a work outcome indicative of employees successfully meeting the goals or activities as described in their job descriptions, thereby augmenting organizational effectiveness (Goodman & Svyantek, 1999). Employees rated their daily work performance on a four-item scale (Ten Horn et al., 1996). Sample items were "Today, my work performance was excellent", and "Today, I fulfilled my roles and responsibilities in an effective manner" ($\alpha = 0.76$). We chose to use self-reported measures of work performance because, especially on a daily level, performance may be difficult to assess by others. Many of the employees in our sample had some flexibility in work times and location and did not see their supervisors or coworkers every day. Supervisor or coworker ratings may therefore not have given a more accurate assessment of the individual's work performance.

3.2.2. Communication control

Communication control refers to the employee's ability to influence the timing of incoming and out-going work-related communication, which we measured by a scale from Ten Brummelhuis et al. (2011). The three items were: "Today, I could decide as to when I would send or reply to emails", "Today, I could influence the timing of incoming and outgoing phone calls", and "Today, I had the feeling of being in control over the communication I had for work" ($\alpha = 0.83$).

3.2.3. Communication effectiveness

Daily communication effectiveness at work refers to communication that efficiently and effectively contributes to the achievement of work goals and was assessed by four items from the Communication Quality Scale (CQS; Ten Brummelhuis et al., 2012). We asked participants' assessment of the quality of communication they had on a day using items such as: "Today, the e-mail conversations I had with colleagues were efficient", "Today, the phone calls I had were useful" and "Today, the e-mail conversations I had today were necessary for completing my work tasks" ($\alpha = 0.65$).

3.2.4. Emotional support given

Emotional support refers to providing the receiver with encouragement, understanding, attention, and positive regard (King et al., 1995) through listening to the support recipient and showing interest, concern, and care for the person. We selected three items from the Family Support Inventory (King et al., 1995), adjusted for measuring emotional support at work (Ten Brummelhuis & Greenhaus, 2018). This measure thus covers the "giving" part of the need for relatedness. Sample items were: "Today, I made time to listen to my coworkers' problems", and "Today, I showed interest in my coworkers' day" ($\alpha = 0.74$). 9.)

3.2.5. Availability

Daily availability for work refers to an active communication style whereby the employee makes sure s/he can be reached by colleagues, supervisors, and customers and was assessed by four items from the CQS (Ten Brummelhuis et al., 2012). Sample items were: "Today, it was easy for my colleagues to reach me", "Today, I answered emails that I received within two hours" and "Today, I responded on short notice when I noticed someone tried to reach me" ($\alpha = 0.77$).

3.2.6. Interruptions

Interruptions refer to episodes in which the employee is interrupted in their tasks by an unscheduled communication (Rennecker & Godwin, 2005). Daily interruptions were assessed by three items from the CQS (Ten Brummelhuis et al., 2012). Items were: "Today I received several telephone calls at inconvenient times", "Today, emails frequently disrupted my work" and "Today, I was interrupted several times in my work task by emails and phone calls" ($\alpha = 0.79$).

3.2.7. Controls

We controlled for daily hours worked, which was measured as a continuous variable. Work hours may increase opportunities to be available or experience interruptions, and at the same time may lead employees to feel they performed better (Chesley, 2010).

3.3. Analysis

We tested our hypotheses using multi-level structural equation modeling in Mplus (Muthén & Muthén, 2012). This approach makes it possible to estimate within-person relationships, while taking into account the nested nature of our data (days nested in employees). Our two-level model had 1135 days at the first level and 317 employees at the second level. We obtained the proportion of variance that was attributed to the different levels of analysis for each variable through the intra class correlations (ICC) in the null model. A significant share of the variance could be attributed to within-person differences for work performance (62.1%), communication control (49.4%), communication effectiveness (50.9%), emotional support given (67.0%), availability (66.2%) and interruptions (55.3%), justifying our multi-level approach.

Because all daily variables were measured at the same time, bias due to common method variance (CMV) is a concern (Podsakoff et al., 2012). Therefore, we conducted the unmeasured latent method construct (ULMC) technique as described by Richardson et al. (2009), in which four models are estimated to compare their model fit. All models were estimated at the within level, as our model consists of level-1 variables only. We first estimated a trait-only model, in which all indicators load on the intended latent factors ($\chi^2 = 620.92$, $df = 174$). We then estimated a method-only model, in which all items loaded on one latent factor ($\chi^2 = 3389.91$, $df = 189$). Because the trait-only model fitted the data significantly better $\Delta\chi^2(15) = 2768.99$, $p < .001$, the observed variance in our predictor and outcome variables is not because of method alone. We then estimated a trait-method model in which the first two models are combined ($\chi^2 = 474.56$, $df = 153$), and a restrained model ($\chi^2 = 469.75$, $df = 162$), which is the trait-method model with the correlations between the latent predictor and outcome variables constrained to the values from the trait-only model. Because the restrained model did not fit the data significantly worse than the trait-method model $\Delta\chi^2(9) = 4.81$, ns , there is no evidence that there is CMV bias in our model.

Consequently, following Anderson and Gerbing (1988), we estimated a measurement model to assess the fit of the model's measurement components before estimating a structural model, which includes causal pathways between the latent constructs. As recommended by Little et al. (2002), we used parcels to create a more reliable measurement model. We followed the Item-to-Construct Balance procedure as described by Little et al. (2002), creating three parcels for each construct.

In the structural model, we person-mean centered the Level-1 predictor and mediator variables allowing examination of the hypothesized within-person relationships (Enders & Tofighi, 2007; Gabriel et al., 2019; Ohly et al., 2010). Pathways were modeled as fixed effects under the theoretical assumption that the relationships under study are similar across individuals (Snijders, 2005). Our mediation model included direct effects of the predictor variables on the outcome variable (Hayes, 2017). We estimated our structural model without the control variable work hours, and then we included work hours as a predictor on each endogenous variable. Work hours was positively related to emotional support provided ($\gamma = 0.28$, $SE = 0.14$, $p < .05$), but did not change the relationships in our model. Therefore, we dropped this control variable from the model to create a more parsimonious model (Spector & Brannick, 2011).

For the indirect effect analysis, we used the indirect model command in Mplus, which gives the specific indirect estimate of each pathway in our model. In addition, we calculated the 95% bias corrected confidence intervals of each indirect effect using the Monte Carlo method in R with 20,000 repetitions (Bauer et al., 2006). An indirect effect is significant if the 95% confidence interval does not include zero.

4. Results: Study 1

4.1. Descriptive statistics

The measurement model included six latent variables: (i) work performance, (ii) communication control, (iii) communication effectiveness, (iv) emotional support given, (v) availability, and (vi) interruptions. The measurement model using three parcels for each latent variable showed a good fit to the data ($\chi^2 = 366.96$, $df = 120$, $p < .001$, $RMSEA = 0.043$, $CFI = 0.94$, $TLI = 0.92$, $SRMR = 0.045$), with all items loading significantly on the intended latent factor, and item loadings ranging from 0.39 to 0.93.

Table 1 shows the means, standard deviations, and correlations of the model variables. Daily availability was positively related to daily work performance ($r = 0.14$, $p < .01$), daily communication control ($r = 0.33$, $p < .01$), daily communication effectiveness ($r = 0.39$, $p < .01$), and daily emotional support given ($r = 0.16$, $p < .01$). Daily interruptions were negatively related to daily work performance ($r = -0.10$, $p < .01$), and daily communication control ($r = -0.17$, $p < .01$), while being positively related to emotional support given ($r = 0.10$, $p < .01$). Both communication control ($r = 0.14$, $p < .01$) and communication effectiveness ($r = 0.15$, $p < .01$) were positively related to work performance.

4.2. Hypothesis testing

Table 2 reports the unstandardized pathway estimates of the within-level relationships in the structural model. The structural model had a good model fit ($\chi^2 = 249.35$, $df = 123$, $p < .001$, $RMSEA = 0.030$, $CFI = 0.95$, $TLI = 0.94$, $SRMR = 0.045$).¹ Daily availability was positively related to daily communication control ($\gamma = 0.56$, $SE = 0.10$, $p < .001$), whereas daily interruptions were negatively related to daily communication control ($\gamma = -0.28$, $SE = 0.07$, $p < .001$), supporting Hypotheses 1a and 1b. In line with Hypothesis 2a, availability was positively related to communication effectiveness ($\gamma = 0.85$, $SE = 0.14$, $p < .001$). Hypothesis 2b was not supported because interruptions were not significantly related to communication effectiveness. Availability was positively related to emotional support given ($\gamma = 0.25$, $SE = 0.06$, $p < .001$), whereas interruptions were not significantly related to emotional support given. These results therefore provide support for Hypotheses 3a, but not for Hypothesis 3b.

In turn, we examined the relationships between the three mediator variables and work performance. Communication control² and emotional support given were not significantly related to daily work performance. However, communication effectiveness was significantly, and positively, related to work performance ($\gamma = 0.17$, $SE = 0.07$, $p < .05$). The indirect effect analysis confirmed that availability was significantly positively related to work performance via communication effectiveness ($\gamma = 0.14$, $SE = 0.06$, 95% bootstrapped CI = 0.028–0.208). These results provide support for Hypothesis 5a, whereas we did not find support for Hypotheses 4a and 6a. Because none of the indirect relationships between interruptions and work performance were significant, Hypotheses 4b, 5b and 6b were not supported. Finally, we found a direct negative effect of daily interruptions on daily work performance ($\gamma = -0.09$, $SE = 0.05$, $p < .05$).

4.3. Brief discussion

The results of Study 1 show that availability is positively related to communication control, communication effectiveness, and emotional support provided at work. However, only communication effectiveness was related to higher levels of daily work performance. Therefore, the indirect effect of availability on work performance was only mediated by communication effectiveness, and not by communication control or emotional support provided at work. This implies that on days on which employees are more available, they find communication for work more effective, and perform better as compared to days in which they are less available. Although interruptions were associated with reduced communication control, interruptions did not affect work performance through the mediating mechanisms. Instead, we found a direct negative relationship between interruptions and work performance. Thus, on days with more interruptions, employees reported lower work performance as compared to days with fewer interruptions.

Study 1's findings suggest that communication effectiveness plays a key role in the link between availability and performance. However, this study was somewhat limited in the examination of the role of social support at work because our measure focused on

¹ We also estimated the causally reversed model, in which work performance predicts the three mediators, and the three mediators predict interruptions and availability. This model had a significant worse model fit ($\Delta\chi^2 = 72.99$, $\Delta df = 8$, $p < .001$) than the hypothesized model.

² Because communication control is a specific form of autonomy at work, we also estimated a model in which we replaced communication control with a three-item measure of general job autonomy (Schaufeli & Bakker, 2004; sample item = Today, I could decide which tasks I focused on; $\alpha = 0.91$). This model had a good model fit. Similar as to a model with communication control, availability was positively ($\gamma = 0.41$, $SE = 0.08$, $p < .001$) and interruptions negatively ($\gamma = -0.16$, $SE = 0.06$, $p < .01$) related to job autonomy, whereas job autonomy was not significantly related to work performance ($\gamma = 0.06$, $SE = 0.06$, ns). Communication quality was also positively related to work performance ($\gamma = 0.17$, $SE = 0.07$, $p < .05$) in this model. We therefore conclude that the focus on communication control did not explain the absence of a significant effect on work performance.

Table 1

Study 1: Means, standard deviations, and correlations.

	Mean	SD	1	2	3	4	5	6
1. Self-rated performance	3.51	0.42	–					
2. Communication control	3.81	0.54	0.14**	–				
3. Communication effectiveness	3.74	0.40	0.15**	0.27**	–			
4. Emotional support given	3.33	0.61	0.02	0.02	0.17**	–		
5. Availability	3.60	0.60	0.14**	0.33**	0.39**	0.16**	–	
6. Interruptions	2.63	0.61	–0.10**	–0.17**	0.02	0.10**	0.02	–
7. Work hours	8.04	2.00	0.04	–0.02	0.06	0.07*	0.07*	0.04

Note. $N = 1135$ (317 employees). ** $p < .01$, * $p < .05$.

Table 2

Study 1: Multilevel SEM analysis of daily availability and interruptions on daily work performance.

	Communication Control		Communication effectiveness		Emotional Support Given		Work Performance	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Availability	0.556***	0.099	0.853***	0.135	0.245***	0.056	0.042	0.105
Interruptions	–0.278***	0.072	–0.014	0.098	0.080	0.060	–0.094*	0.049
Communication control							0.055	0.062
Communication effectiveness							0.165*	0.071
Emotional support given							–0.029	0.046
R^2	0.265***	0.056	0.421***	0.077	0.065*	0.028	0.076**	0.029

Note. $N = 1135$ (317 employees). *** $p < .001$, ** $p < .01$, * $p < .05$. Unstandardized regression estimates and standard errors (SE). Two-tailed significance tests are reported.

emotional support provided only. It is possible that employees do not provide emotional support as much through electronic communication, but rather help coworkers with a task or work-related problem. In other words, availability and interruptions may have implications for the instrumental support coworkers give to each other. Therefore, in Study 2, we replicate Study 1, but extend it by examining how connectivity is related to the instrumental support given to and received from coworkers.

5. Methods: Study 2

5.1. Sample and procedure

A master student recruited employees in her professional and personal network who worked for a variety of organizations in the South Western region of the Netherlands. We targeted employees who used electronic communication for work (e.g., email, smartphone, videoconferencing), and worked in jobs in which it was possible to work at different locations than supervisors or team members (e.g., working from home or a client's worksite). As a result, a large majority (70.8%) of employees worked in the professional service sector, including financial and banking services, HR consulting, and strategic consulting. The master student sent out an invitation email with a link to sign up for the study to 104 employees. Of those employees, 72 participated in the study (69.2% response rate).

Participants filled in a general survey with questions about background characteristics before the start of the daily part of the study. Then, from Monday through Friday, participants received an email with a link to the online daily survey at 5 pm. A reminder to fill in the survey was sent at 6 pm. The 72 participants completed a total of 324 daily surveys in the correct time slot (Monday $N = 72$, Tuesday $N = 64$, Wednesday $N = 66$, Thursday $N = 62$, Friday $N = 60$). About half of the participants were female (56.9%) and had on average 12.2 years of work experience ($SD = 10.5$). Most employees had a partner (69.4%) and 51.4% of the respondents had children. Most participants had obtained a master's degree (72.2%) or bachelor's degree (20.8%), whereas 7.0% completed high school without further education. Respondents' mean weekly contractual work hours were 36.7 h ($SD = 5.6$).

Respondents worked primarily in professional services (70.8%), although other industries such as governmental organizations (2.8%), health care (2.8%), and education (2.8%) were represented as well.

5.2. Measures

Unless otherwise indicated, a five-point response scale was used, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). All measures were at the daily level.

5.2.1. Work performance

Employees rated their daily work performance using seven items from Goodman and Svyantek's (1999) task performance scale. Items were selected based on their relevance for daily measurement. Sample items were "Today, I performed well by carrying out tasks as expected", and "Today, I met the criteria for performance" ($\alpha = 0.81$).

5.2.2. Communication control

Communication control was measured by the same scale used in Study 1 (Ten Brummelhuis et al., 2011). The reliability of this scale was adequate ($\alpha = 0.74$).

5.2.3. Communication effectiveness

Daily communication effectiveness for work was assessed by four items from the CQS (Ten Brummelhuis et al., 2012). Because this scale had a suboptimal reliability in Study 1, we complemented it with two items that, in line with the definition of communication effectiveness, tap into the efficiency and effectiveness of communication. The additional items were: "Today, the communication I had with colleagues was effective" and "Today, the communication with colleagues was efficient". The reliability of the six-item scale was adequate ($\alpha = 0.74$).

5.2.4. Emotional support given

Emotional support provided was measured by the same three-item daily scale used in Study 1 (King et al., 1995; Ten Brummelhuis & Greenhaus, 2018). The reliability of this scale was adequate ($\alpha = 0.71$).

5.2.5. Instrumental support given

Instrumental support refers to tangible and practical aid with the intend to help the received (House, 1981). We selected three items from the Goodman and Svyantek's (1999) contextual performance scale that concern providing help to colleagues, and that are relevant for daily measurement. Sample items were "Today, I helped colleagues who had a heavy workload", and "Today, I assisted colleagues with their duties" ($\alpha = 0.75$).

5.2.6. Instrumental support received

We measured how much instrumental support employees received from coworkers using four items from the Job Content Questionnaire (JCQ; Karasek et al., 1998). Sample items were "Today, a colleague helped me get my work done", and "Today, I could count on a colleague when I ran into a problem" ($\alpha = 0.86$).

5.2.7. Availability

Similar as in Study 1, daily availability for work was assessed by four items from the CQS (Ten Brummelhuis et al., 2012). The scale had an adequate reliability ($\alpha = 0.77$).

5.2.8. Interruptions

Similar as in Study 1, daily interruptions were assessed by three items from the CQS (Ten Brummelhuis et al., 2012), with a reliability of $\alpha = 0.65$.

5.2.9. Controls

We controlled for daily positive affect, using five items from the joviality dimension from the Positive and Negative Affect Schedule–Expanded Form (Watson & Clark, 1994). We asked participants to what extent they felt for instance "delighted" and "excited" throughout the workday ($\alpha = 0.90$). Positive affect may account for systemic variance in the relationship between our predictor and outcome variables, as individuals who are in a positive mood perceive their context through a more positive lens (Podsakoff et al., 2003). For instance, employees who were in a better mood may have overestimated their availability, the quality of communication, and their work performance. Controlling for positive affect is therefore a recommended practice to limit potential bias due to this form of common method variance in daily measurement studies (Gabriel et al., 2019).

5.3. Analysis

We used the same analyses techniques, multi-level structural equation modeling in Mplus, as used for Study 1. Our data included 324 cases (days) nested in 72 persons. We first estimated a null-model which showed significant within-person variance for all variables (work performance = 70.8%; communication control = 80.4%; communication effectiveness = 82.1%; emotional support provided = 78.0%; instrumental support provided = 59.4%; instrumental support received = 60.4%, availability = 0.89.8%; interruptions = 74.9%), justifying our multilevel, within-person focus.

We then estimated a measurement model with parcels, using the Item-to-Construct Balance approach (Little et al., 2002). Finally, we estimated the structural model, including positive affect (a latent factor with three parcels) as a predictor on the mediator and outcome variables to control for common method bias. Pathways were modeled as fixed effects and level-1 predictor and mediator variables were person-mean centered in the structural model (Enders & Tofighi, 2007; Ohly et al., 2010). Direct effects were also included in the structural model (Hayes, 2017) and we used the same bootstrapping method (Bauer et al., 2006) as in Study 1 to obtain the 95% confidence intervals of indirect effects.

6. Results: Study 2

6.1. Descriptive statistics

The measurement model using three parcels for each of the eight latent variables showed a good fit to the data ($\chi^2 = 430.25$, $df = 224$, $p < .001$, $RMSEA = 0.052$, $CFI = 0.91$, $TLI = 0.90$, $SRMR = 0.060$), with all items loading significantly on the intended latent factor, and item loadings ranging from 0.41 to 0.89.

Table 3 shows the means, standard deviations, and correlations of the model variables. Daily availability was positively related to daily work performance ($r = 0.15$, $p < .01$), daily communication control ($r = 0.51$, $p < .01$), daily communication effectiveness ($r = 0.57$, $p < .01$), daily emotional support given ($r = 0.14$, $p < .01$) and daily instrumental support received ($r = 0.14$, $p < .01$). Daily interruptions were negatively related to daily work performance ($r = -0.17$, $p < .01$), daily communication control ($r = -0.32$, $p < .01$), instrumental support received ($r = -0.12$, $p < .05$), while being positively related to daily emotional support given ($r = 0.14$, $p < .01$) and daily instrumental support provided ($r = 0.16$, $p < .01$). Communication control ($r = 0.17$, $p < .01$), communication effectiveness ($r = 0.27$, $p < .01$), emotional support given ($r = 0.16$, $p < .01$), and instrumental support received ($r = 0.16$, $p < .01$) were positively related to work performance.

6.2. Hypothesis testing

Table 4 reports the unstandardized pathway estimates of the within-level relationships in the structural model, including the control variable positive affect. The structural model had a good model fit ($\chi^2 = 446.67$, $df = 295$, $p < .001$, $RMSEA = 0.042$, $CFI = 0.92$, $TLI = 0.90$, $SRMR = 0.064$).³ In support of Hypotheses 1a and 1b, daily availability was positively related to daily communication control ($\gamma = 0.97$, $SE = 0.21$, $p < .001$), whereas daily interruptions were negatively related to daily communication control ($\gamma = -0.70$, $SE = 0.24$, $p < .01$). Daily availability was positively related to communication effectiveness ($\gamma = 1.15$, $SE = 0.19$, $p < .001$), supporting Hypothesis 2a. We did not find support for Hypothesis 2b because interruptions were not significantly related to communication effectiveness. Neither availability, nor interruptions were significantly related to emotional support provided. Although availability was not significantly related to instrumental support provided, it was positively related to instrumental support received ($\gamma = 0.19$, $SE = 0.08$, $p < .05$). This result partially supports Hypothesis 3a. Daily interruptions were positively related to instrumental support given ($\gamma = 0.29$, $SE = 0.13$, $p < .05$), but not to instrumental support received. The significant relationship between interruptions and instrumental support given was opposite to what we had hypothesized, and thus does not support Hypothesis 3b.

In turn, we examined the relationships between the three mediator variables and work performance. Communication control, emotional support given, instrumental support given, and instrumental support received were not significantly related to daily work performance. However, communication effectiveness was significantly, and positively, related to work performance ($\gamma = 0.28$, $SE = 0.12$, $p < .05$). The indirect effect analysis confirmed that availability was significantly positively related to work performance via communication effectiveness ($\gamma = 0.32$, $SE = 0.16$, 95% bootstrapped CI = 0.043–0.665). These results provide support for Hypothesis 5a, whereas we did not find support for Hypotheses 4a and 6c. Because none of the indirect relationships between interruptions and work performance were significant, Hypotheses 4b, 5b and 6b were not supported. Finally, we found a direct negative effect of daily interruptions on daily work performance ($\gamma = -0.32$, $SE = 0.16$, $p < .05$).

6.3. Brief discussion

The results of Study 2 replicated the main findings from Study 1: Availability was positively related to daily work performance through higher levels of communication effectiveness, whereas interruptions were directly negatively related to daily work performance. However, availability was not positively related to emotional support provided, whereas we did find this relation in Study 1. Nevertheless, the inclusion of provided and received instrumental support revealed an interesting pattern with availability and interruptions. On days on which employees were more available, they received more instrumental support from coworkers. On days with more interruptions, however, employees provided more instrumental support to coworkers. These findings suggest that employees may make oneself available when they need help or advice from coworkers. When employees are interrupted, it is more likely that coworkers need help or advice from them.

7. General discussion

We aimed to shed light on the paradoxical relation between constant connectivity and work performance by examining how two sides of constant connectivity – availability and interruptions – relate to feelings of autonomy, competence, and relatedness in a communication context. More specifically, we investigated if availability and interruptions were associated with employees' perception of communication control, communication effectiveness, and social support at work. The analysis of two daily samples showed that availability was indirectly positively related to work performance through higher levels of communication effectiveness,

³ We also estimated the causally reversed model, in which work performance predicts the four mediators, and the three mediators predict availability and interruptions. This model had a significantly worse fit ($\Delta\chi^2 = 38.45$, $\Delta df = 8$, $p < .001$) than the hypothesized model.

Table 3
Study 2: Means, standard deviations, and correlations.

	Mean	SD	1	2	3	4	5	6	7	8
1. Self-rated performance	3.98	0.45	–							
2. Communication control	3.78	0.73	0.17**	–						
3. Communication effectiveness	3.78	0.48	0.27**	0.33**	–					
4. Emotional support given	3.37	0.69	0.16**	–0.03	0.21**	–				
5. Instrumental support given	2.80	0.68	0.07	–0.12*	0.07	0.52**	–			
6. Instrumental support received	3.68	0.56	0.16**	0.02	0.26**	0.36**	0.23**	–		
7. Availability	3.48	0.84	0.15**	0.51**	0.57**	0.14**	–0.01	0.14**	–	
8. Interruptions	2.49	0.71	–0.17**	–0.32**	–0.00	0.14**	0.16**	–0.12*	–0.07	–
9. Positive affect	3.20	0.40	0.20**	0.18**	0.14*	0.12*	0.02	0.06	0.10	–0.12*

Note. N = 324 (72 employees). ** p < .01, * p < .05.

Table 4
Study 2: Multilevel SEM analysis of daily availability and interruptions on daily work performance.

	Communication control		Communication effectiveness		Emotional support given		Instrumental support given		Instrumental support received	
	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.	Estimate	S.E.
Availability	0.970***	0.205	1.151***	0.186	0.193	0.165	–0.043	0.120	0.193*	0.080
Interruptions	–0.695**	0.235	0.112	0.196	0.331	0.197	0.288*	0.134	–0.057	0.156
Positive affect	0.050	0.154	0.235*	0.112	0.275*	0.113	0.134	0.109	0.089	0.104
R ²	0.595***	0.097	0.583***	0.073	0.161	0.108	0.082	0.063	0.049	0.035

	Work performance	
	Estimate	S.E.
Availability	–0.216	0.243
Interruptions	–0.323*	0.162
Communication control	–0.002	0.107
Communication effectiveness	0.277*	0.120
Emotional support given	0.344	0.386
Instrumental support given	–0.166	0.343
Instrumental support received	–0.032	0.100
Positive affect	0.130	0.113
R ²	0.225**	0.076

Note. N = 324 (72 employees). *** p < .001, ** p < .01, * p < .05. Unstandardized regression estimates and standard errors (SE). Two-tailed significance tests are reported.

whereas interruptions were directly negatively related to self-rated work performance. These results suggest that availability might be responsible for the beneficial effect of being constantly connected to work, while the interruptions that often go hand in hand with connectivity (Rennecker & Godwin, 2005) are more likely to hinder work performance. Moreover, our studies reveal that communication effectiveness plays a pivotal role in the link between connectivity and work performance. These findings are in line with conceptual research on new media technology and flexible work arrangements (e.g., telework), which proposed that the quality of communication must be guaranteed to maintain work performance when employees are more dispersed and connected to each other through ICT (Day et al., 2019; Van Dyne et al., 2007). Our studies add to this line of research by specifying that employees who actively connect with others (e.g., making phone calls, or replying to emails), perceive their communication as more efficient and effective, and report better work performance.

Interestingly, interruptions were directly, negatively, related to work performance, without the intervention of needs mechanisms. Our findings therefore suggest that a needs perspective might be particularly useful to understand the benefits of connectivity but is less suitable to understand the harmful effects of connectivity on work performance. Although a need perspective might help to understand the impact of interruptions on well-being (Day et al., 2019), our results suggest that the implications of interruptions for work performance might be better explained by alternative mechanisms. The episodic process model of work performance (Beal et al., 2005) is one example of such a model, as it explains how interruptions might trigger negative affect and consume cognitive effort, thereby impairing work performance.

In addition, we found that employees felt more control over their communication on days in which they were more available at work, whereas daily interruptions went together with feelings of impaired communication control. Social support given to and received from coworkers was affected by availability and interruptions as well. Employees received more instrumental support on days in which they were more available whereas they provided more instrumental support to coworkers on days in which they were more frequently interrupted. Although we found in Study 1 that employees provided more emotional support on days they were more available, we could not replicate this finding in a model that also included instrumental support (Study 2). It is possible that there is a more intricate dynamic in giving and receiving support than we were able to measure. For instance, employees who actively reach out

to colleagues (high availability) might ask for instrumental support from a colleague but provide emotional support while making this request. Alternatively, industries and organizations might vary in which type of support is most commonly exchanged. For example, in organizations with a bottom-line culture, employees might only exchange instrumental support, whereas in organizations with a culture of care emotional support is exchanged as well.

Although communication control and giving or receiving social support at work were not related to work performance in our studies, these results are important as they might help explain consequences for other outcomes. For instance, it is possible that interruptions contribute to stress because employees experience less control over their communication (Day et al., 2019). Similarly, availability might improve team cohesion if members give each other more emotional support (Van Dyne et al., 2007).

7.1. Theoretical implications

This study advances previous literature on constant connectivity in several ways. To begin with, by differentiating between availability and interruptions we can identify what particular aspect of connectivity helps versus hinders work performance. Whereas employees seemed to benefit from being available for others at work – as indicated by higher levels of work performance on days on which employees were more available –, the daily interruptions that are inherent to constant connectivity were associated with lower levels of daily work performance. These findings confirm previous qualitative studies, which reported that employees assess that connectivity through the use of computer, cell phone, and email helps them to be more effective, but that ongoing connectivity also adds to their workload and thereby impedes their productivity at work (Cavazotte et al., 2014; Matusik & Mickel, 2011; Mazmanian et al., 2013). Advancing this line of research, our results suggest that the enhanced availability that is inherent to connectivity might be responsible for its positive effects on work performance, whereas interruptions might be responsible for the negative effects of constant connectivity on work performance.

Second, we further knowledge on the implications of constant connectivity by examining the mechanisms that link connectivity to employee outcomes. In particular, we complement research on the autonomy paradox (Mazmanian et al., 2013) by empirically testing its core assumptions. The autonomy paradox assumes that, on the one hand, employees experience increased autonomy because mobile work devices give them more flexibility in where, when, and how they work, while on the other hand, excessive connectivity diminishes their autonomy as they become tethered to their devices, unable to escape from work communication (e.g., Leonardi et al., 2010; Mazmanian, 2013; Mazmanian et al., 2013; Putnam et al., 2014). Our results confirmed that being available for others was associated with increased feelings of communication control, whereas interruptions were related to impaired feelings of communication control. These findings are in line with the main assumption of the autonomy paradox. In addition, we further specified and expanded the key concept ‘autonomy’. Research on the autonomy paradox has used autonomy as an overarching term for various work aspects that employees may have control over, including work times, work location, scheduling of tasks and the content of tasks (e.g., Leonardi et al., 2010; Mazmanian, 2013). Because new media technology has changed and intensified the way employees communicate (Boswell & Olson-Buchanan, 2007; Chesley, 2014), we argue that control over *communication* is a crucial aspect of autonomy at work. Connectivity enhances but also undermines the control employees have over in- and outgoing communication, and therefore, control over communication seems the first logical aspect of autonomy that is affected by constant connectivity.

Third, using insights from the productivity and social connectivity paradoxes as proposed by Day et al. (2019), our study complements research on the autonomy paradox by examining the role of two additional mechanisms. Guided by insights from SDT and Day et al.’s (2019) model, we investigated how availability and interruptions not only relate to the need for autonomy (communication control), but also the needs for competence (communication effectiveness) and relatedness (social support at work). The use of a needs approach resulted in two take-away messages. To begin with, availability and interruptions were clearly associated to the three needs, with availability positively relating to all three needs. Interruptions seemed to go together with a frustrated need for autonomy, but was at the same time positively associated to relatedness (i.e., higher levels of instrumental support provided to colleagues). A need perspective seems therefore promising to explain the implications of two sides of connectivity on a variety of work outcomes (e.g., stress, work engagement). In addition, when explaining work performance, the need for competence (i.e., communication effectiveness) played a more prominent role than the needs for autonomy and relatedness. This finding is in line with SDT research (see for a meta-analysis, Van den Broeck, Vansteenkiste, & De Witte, 2008) showing that the need for competence is particularly important in predicting task performance.

Finally, we mention a methodological contribution of our study. The use of diary studies to examine work processes has become increasingly popular (e.g., Butts et al., 2015; Sonnentag et al., 2018) because researchers recognize that some work processes can differ between days (e.g., work performance), or occur in some episodes but not in others (e.g., interruptions). Similarly, work connectivity can vary within a week (Leonardi et al., 2010) as employees may work from home on some days but not others. Our daily study design confirmed that availability and interruptions vary between days, and that this variability matches with daily variations in work performance.

7.2. Practical implications

The insights from this study can help employees and employers who seek to maximize the benefits of connectivity, while limiting its possible downsides. Because constant connectivity has both positive and negative effects on work performance (Mazmanian et al., 2013), it is important to find ways to lessen its negative side, such as incoming interruptions, while stimulating its positive side – employees’ availability. To do so, organizations could make rules regarding electronic communication, defining timing, communication channels, and subjects that should or should not be discussed through electronic communication (Boswell et al., 2016; Perlow,

2012). For instance, companies could decide to allow work-related communication through all possible channels (e.g., email, phone, instant messaging, in-person) between 10 am and 4 pm only, thereby facilitating focus time early and later in the day. Similarly, some software (e.g., Microsoft Teams) includes options for employees to schedule uninterrupted work time. During this blocked period, an employee can choose to have all incoming messages muted or allow notifications of messages from a few important stakeholders.

It is important that a chosen policy balances the trade-off between availability and interruptions. While a restrictive policy might mitigate the negative consequences of interruptions, it might also hamper the positive effects of being available for others. Decisions to reduce access to technology may be understandable in some cases, however, based on our findings it seems particularly useful to create organizational norms or rules that promote availability among employees so that efficient and effective communication can be guaranteed, while at the same time creating moments in the day for uninterrupted work. If balanced well, technology tools, in combination with organizational norms that allow employees to disconnect when they need to focus, could help employees to manage their connectivity in a way that enhances their productivity levels.

7.3. Limitations and future research

Despite various strengths, including the use of diary data in two datasets, our research has several limitations. First, because we only used one measurement moment per day, our research design does not test the causality of the relationship in our model. Our hypotheses were strongly embedded in theory, using insights from SDT (Ryan & Deci, 2000) and the ICT paradoxes (Day et al., 2019), which posits that connectivity first affects the three needs, whereas need satisfaction predicts performance. Moreover, we underscore that interruptions reflect unexpected episodes (Rennecker & Godwin, 2005) that are more likely to trigger evaluations (e.g., communication effectiveness) and behavior (e.g., helping a coworker who calls) than vice versa. Similarly, availability is a state of connectivity that is required to make certain value assessments (e.g., how effective communication is) or to engage in certain behaviors (e.g., lending a listening ear).

Nevertheless, it is possible to provide arguments for reverse relationships. For instance, employees who do not perform well might let incoming messages be an interruption, just to think about something else or to be useful for someone else (Bolino et al., 2013). Although a model with relationships in the reversed causal direction fit our data significantly worse in both studies, it would be important to replicate the study longitudinally, or with ESM studies using multiple measurement moments per day, to confirm the causal relationships between these constructs. Nevertheless, our results are valuable as they show that daily availability goes hand in hand with higher performance, whereas daily interruptions go together with impaired work performance.

Second, all variables in our model were self-reported and measured at the same time, which raised concerns of common method variance due to mood influences or social desirability. To mitigate these concerns, we performed the ULMC technique (Richardson et al., 2009) in Study 1, and controlled for positive affect in Study 2 (Podsakoff et al., 2012). Nevertheless, future studies could use multiple measures per day (e.g., measuring interruptions during the day and work performance at the end), or combine self-reports with other data sources, for example by recording how long employees are online or how frequently they check work e-mails.

Third, the use of self-reported performance measures leaves unanswered if work performance as perceived by the respondent is in line with the perspective of others, such as supervisors and co-workers. We underscore, however, that the employee's perspective on their performance is particularly relevant among the professionals represented in our samples, who are independent and self-motivated (Mazmanian et al., 2013). In this group, performance perceptions function as feedback systems for employees' confidence, self-esteem and self-efficacy (Bandura, 1982), and have ongoing implications for how well they function at work. Nevertheless, it would be interesting to examine how other stakeholders view the performance levels of available and interrupted employees. Therefore, self-reported measures of work performance could be complemented by supervisor, coworker, or client ratings in future research.

Fourth, our conceptualization of the two sides of constant connectivity is somewhat narrow and could be broadened in future studies. For example, in addition to interruptions, an "always-on" culture and telepressure are important implications of constant connectivity (Barber & Santuzzi, 2015; Perlow, 2012). More specifically, Mazmanian (2013) stresses the importance of "understanding the social origins and potential social solutions to traps of connectivity" (p. 1247), referring to the organization's role in the development of norms around constant connectivity. Similarly, more aspects of autonomy could be examined. For instance, it would be interesting to link availability and interruptions to employee's experienced control over work times and work location, and examine reversed relationships (e.g., on days on which the employee works from home, interruptions increase).

Future research is also necessary to better understand our findings related to social support. In Study 2, using a model that included emotional support and instrumental support, we were unable to replicate the positive relations between availability and emotional support provided as found in Study 1. It would be interesting to examine if actively connecting with colleagues triggers a pattern in which different types of support are given and received. For instance, it is possible that employees request and receive instrumental support and then provide a colleague with emotional support (or vice versa). It would be equally important to investigate if a balance in availability and interruptions increases feelings of relatedness and teamwork (e.g., cohesion and team performance), because team members receive and provide equal levels of instrumental support. Finally, we encourage researchers to examine possible boundary conditions of the reported relationships. For instance, it is possible that general levels of job control (i.e., job autonomy), personality (e.g., openness to experience), or organizational culture (e.g., high work pressure climate) weaken or strengthen the implications of constant connectivity on employee outcomes.

8. Conclusion

The paradoxical effects of constant connectivity have been eloquently described in qualitative research and conceptual models (Day et al., 2019; Mazmanian, 2013; Mazmanian et al., 2013). Building on this valuable work, our research answered the question of how two sides of constant connectivity are related to work performance. Results from two studies showed that employees experienced higher levels of communication effectiveness and performed better on days in which they were more available for colleagues. On days with more interruptions, employees assessed that their work performance was lower. We hope that our study helps employees and organizations to find a balance between the pros and cons of constant connectivity. Policies that let employees decide when they are available and allow them to schedule uninterrupted worktime seem most promising, as they optimize the benefits of connectivity, while limiting its pitfall.

CRedit authorship contribution statement

Lieke L. ten Brummelhuis: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Writing – original draft. **Claartje L. ter Hoeven:** Conceptualization, Investigation, Resources, Writing – review & editing. **Mariana Toniolo-Barrios:** Investigation, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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