



Multitasking and Work-Life Balance: Explicating Multitasking When Working from Home

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ABSTRACT

The present study explicates four types of multitasking when working from home according to their medium and social interactivity, and further explores the antecedent and consequences of different types of multitasking. A total of 429 U.S. employees who worked from home participated in an online survey in August 2020 during the COVID-19 pandemic. Results indicated that a balance between work and life identities was positively associated with technology-mediated and in-person high-interactive multitasking during work time, but not with low-interactive multitasking. In-person high-interactive multitasking, in turn, was related to greater interference with work but a higher level of life satisfaction. In addition, men and women experienced different levels of work-life identity balance and adopted different types of multitasking to achieve such a balance.

Introduction

The COVID-19 pandemic launched the world's largest work-from-home experiment. Some companies directed employees to work from home for the remainder of 2020 and longer (Fung, 2020). A survey conducted in 2020 found that 54% of the 25,000 working adults would like the opportunity to primarily work from home, and 75% would like the option to do it occasionally (IBM, 2020). The pandemic may permanently shift future working patterns to embrace remote work or to integrate it with on-site work. However, working from home raises some questions about productivity (Marchewka et al., 2020) by cramming work and life into the home space,

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and it requires a delicate work-life balance between domestic and professional tasks, often achieved by performing multiple tasks simultaneously or juggling from one task to another. This is usually termed multitasking – simultaneously performing multiple tasks or switching rapidly from one task to another to accomplish distinct goals (Wang & Tchernev, 2012), and research has found that a majority of multitasking involves electronic media (Xu et al., 2019).

Multitasking has become not only a way of work, but a way of life for many

(Kirchberg et al., 2015; Stephens et al., 2012; Voorveld & van der Goot, 2013), as it has become a coping strategy in response to the increasing demand in both professional, personal, and family duties (Weintraub et al., 2019). The current study focuses on multitasking when working from home during the pandemic. Given the prevalence of multitasking during work hours (e.g., Mark et al., 2016), an abundance of research is devoted to examining how multitasking may influence workers' effectiveness and performance (Hemani & Rashidi, 2016; Marchewka et al., 2020), work pace and workload (Stephens et al., 2012), job and life satisfaction (Conte et al., 2019), and work-life balance (Weintraub et al., 2019).

However, multitasking has been used as an umbrella term in most media and communication research, and the differences among various multitasking behaviors have been overlooked. For example, we cannot simply conclude whether technology-mediated multitasking during remote work, such as listening to music, is as harmful or beneficial as in-person multitasking, such as taking care of children, because their outcomes depend on different task characteristics (Wang et al., 2015). Previous studies on workers' multitasking behaviors or polychronicity, i.e., multitasking preferences, did not differentiate the nuances in cognitive demand among a variety of multitasking activities (Kirchberg et al., 2015; Mark et al., 2016). Thus, drawing a general conclusion on the effects or antecedents of "multitasking" may be oversimplistic because this concept is underspecified and can refer to considerably different cognitive phenomena.

Further, how multitasking, a strategy to integrate work and life roles, is associated with work-life balance remains unresolved (e.g., Korabik et al., 2017; Weintraub et al., 2019). Research on boundary management theory (Kossek & Lautsch, 2012; Kossek et al., 2006) has generated valuable insights into this question. Boundary management theory posits that driven by work and life identities, individuals adopt different approaches to manage the boundary between work and life tasks, such as integrating work and life responsibilities (Kossek & Lautsch, 2012; Kossek et al., 2006, 2012), which will influence work-life conflict and well-being (Matthews & Barnes-Farrell, 2010; Qiu & Fan, 2015). Thus, the primary goal of the current study is to theoretically bridge multitasking research and boundary management theory

to examine how different types of multitasking, as a strategy to integrate work with life, are associated with work-life identity and work-life outcomes. In addition, previous research examined the role of gender in multitasking (Korabik et al., 2017; Offer & Schneider, 2011), work-life identity, and employee well-being (Gutek et al., 1991; Williams, 2000; for a review, see Eby et al., 2005), and found that men and women engaged in different kinds of multitasking (Keene & Quadagno, 2004). Thus, the current study will continue examining if men and women perform different types of multitasking, and/or experience different levels of work-life identity and work-life well-being.

Taken together, the purpose of this study is three-fold. First, it aims to explicate and differentiate different types of multitasking when working from home according to their medium and social interactivity (Wang et al., 2015). Second, by bridging the multitasking literature (Wang et al., 2015; Weintraub et al., 2019) and boundary management theory (Kossek & Lautsch, 2012; Kossek et al., 2006), this study examines the antecedent and consequences of different types of multitasking. Lastly, it explores the gender differences of the proposed relationships and key variables.

Explicating and Differentiating Multitasking

Compared with working onsite in the company, working from home provides greater flexibility for multitasking. The ubiquity of mobile technologies has facilitated the prevalence of multitasking in the workplace (De Bruin & Barber, 2019). With media technologies, employees can be physically present at the workplace but psychologically connecting with family or friends at the same time via media such as texting, using social media, or making phone calls. However, compared to working at the company's office, working from home affords in-person interaction with family members within the same household, and opportunities to take care of family members and/or handle household chores during work time (Kossek et al., 2006). In-person multitasking with personal and family activities at home is a unique advantage, or challenge, of remote work. It is important to consider both technology-mediated multitasking and in-person multitasking while working from home. Technology-mediated multitasking usually involves devices to engage in a non-work related activity, such as listening to music, answering phone calls, watching TV/videos, or using social media. In-person multitasking involves interacting with others face-to-face and/or handling household chores at home.

Further, based on the cognitive framework of multitasking (Wang et al., 2015), the present study differentiates two types of multitasking during remote work: high-interactive multitasking and low-interactive multitasking. The term "interactive," according to Markus (1987) in her classic

communication paper, emphasizes *social interactivity* and refers to activities that afford communication flow and relationship building among members in the social unit, and typical media examples are telephone, text messaging, and social media. Based on this definition, we focus on the *social interactivity* of multitasking in the current study, i.e., the multitasking activities for building social relationships via technology or in-person (Lowry et al., 2009; Markus, 1987). Social interactivity thus differs from human-technology interactivity provided by platforms or devices (Oh & Sundar, 2015; Q. Xu & Sundar, 2016), i.e., using a mouse to click, slide, and flip to change the media content. Therefore, our conceptualization of interactive multitasking includes both social interaction with others *via technology*, i.e., texting, making phone calls, or engaging in social media during work time, and *in-person* interactive multitasking, such as attending to the needs of adult family members, children, and pets during work time (Cain, 1985; Cohen, 2002). Similarly, low-interactive multitasking is marked by activities involving a lower degree of social interactivity, including technology-mediated activities, such as listening to music and watching TV, and in-person activities, including preparing meals and handling household chores.

Based on cognitive resources theories and characteristics of multitasking activities (Wang et al., 2015), high-interactive multitasking, compared with low-interactive multitasking, demands more cognitive resources and is likely to be more disruptive for work. Interactive multitasking activities that require behavioral responses (Wang et al., 2012, 2015), impose time pressure to respond (Wang et al., 2015), offer less control over task switching (Benbunan-Fich et al., 2011; Wang et al., 2015), and involve more emotionally engaging content (Wang et al., 2015) would require more attention allocation.

High-interactive multitasking, due to its nature of interactivity and social engagement, often requires behavioral responses within a relatively shorter period of time, and it is usually out of the control of the multitasker regarding the initiation and the ending of such interactivity. For example, when interacting with friends or family members, in-person or technology-mediated, usually involves decisions on how to respond and the execution of the response. Even when interacting with others via texting or social media platforms, which is a relatively asynchronous social interaction (Walther, 1996), one needs to conform to the social expectation to respond to others' messages, posts, and statuses within a relatively short (or reasonable) period of time (Licoppe, 2004). Otherwise, no or a slow response would be deemed as an act of indifference or rejection (Hall & Baym, 2012). In addition, the initiation and conclusion of interactions are not completely within the control of the workers at home. Typical scenarios of working from home often include responding to an unplanned phone call from a friend, an unexpected outburst of children, or even a needy pet jumping up during

a video conference. Lastly, high-interactive multitasking activities may be more emotionally engaging. For example, one may feel more emotionally involved when helping family members in person or talking with a friend over the phone than cleaning the house or listening to music. Typically, more emotionally involved activities attract more cognitive resources to encode information (Wang et al., 2015). Together, high-interactive multitasking with forced task-switching, decision-making for a behavioral response, and the time pressure that comes with them, adds a more complex dynamic in multitasking during work and demands more attention from work than low-interactive multitasking activities (Wang et al., 2012).

Low-interactive multitasking, on the other hand, generally grants greater control over task switching and does not require an immediate behavioral response, such as listening to music, having a television on in the background, or doing household chores when working from home. The control over when to start and conclude multitasking affords workers more control over the pace of work and non-work activities. For example, one can stop listening to music or stop doing household chores during work when one needs to prioritize some particular work tasks. Low-interactive multitasking does not require an explicit, immediate behavioral response, thus allowing an individual to allocate attention between work and non-work activities more strategically. For example, listening to music or watching TV often does not require constant behavioral adjustment to meet social expectations. Lastly, low-interactive multitasking typically is less emotionally engaging. Consequently, low-interactive multitasking, in-person or technology-mediated, draws less attention from work and is likely to be less distracting than multitasking activities high in social interactivity.

In sum, we explicate and differentiate four types of multitasking behaviors for remote work based on their medium and social interactivity: Technology-mediated high-interactive multitasking, technology-mediated low-interactive multitasking, in-person high-interactive multitasking, and in-person low-interactive multitasking. Table 1 demonstrates the four types of multitasking activities. In the next section, we examine the antecedent and consequences of the four different types of multitasking.

Table 1. Explicating and differentiating multitasking based on medium and interactivity.

	Technology-Mediated	In-Person
High Interactivity	Technology-mediated high-interactive multitasking , e. g., texting, browsing social media, and talking over phone or video chat during remote work.	In-person high-interactive multitasking , e.g., attending to the needs of adult family members, children or pets during remote work.
Low Interactivity	Technology-mediated low-interactive multitasking , e.g., listening to music, or watching TV during remote work.	In-person low-interactive multitasking , e.g., preparing meals and handling household chores during remote work.

The Antecedent of Multitasking

Implicit in the definition of multitasking is the motivation to accomplish multiple goals and/or multiple obligations (Wang & Tchernev, 2012). A growing body of literature has explored the antecedents or motivations for multitasking. For example, Hwang et al. (2014) uncovered three major motives for multitasking: the need for information, the need for efficiency, and the need for habitual routine. Zhang and Zhang (2012) suggested that the needs for convenience and efficiency were predictors of work-related multitasking. From these empirical studies, multitasking seems to be driven by multiple specific goals and needs. A long line of research has illustrated that there are higher-order self-identities that prescribe these specific goals and needs (Carver & Scheier, 1981; Markus & Nurius, 1986).

A central tenet of boundary management theory is that individuals adopt different approaches to fulfill their work and life self-identities and manage the boundary between work and life (Kossek & Lautsch, 2012; Kossek et al., 2006, 2012). One important strategy is integration: workers strive to integrate the work and life activities, and this management strategy influences their work and life outcomes (Kossek & Lautsch, 2012; Kossek et al., 2006, 2012). Though research on boundary management theory has not explicitly connected the integration strategy with multitasking, the integration management style in fact resonates with what multitasking is trying to achieve, as multitasking is a strategy to integrate and manage different social roles in work, family, and personal life. For example, an individual who works from home may also keep an eye on the children and chat with friends via online messaging tools. Such multitasking integrates the individual's multiple social identities as employee, parent, and friend by carrying out work and non-work activities at the same time.

Connecting research on work-life boundary management theory and multitasking, we propose an important yet under-studied antecedent in existing multitasking research, that is, the balance of work and life identities. Self-identities often serve as the motivational force driving our daily activities (Markus & Nurius, 1986; S. Xu & Wang, 2021). Individuals may have multiple role-based identities, such as professional and family/personal identities, of different levels of salience (Settles, 2004). Work identity involves mainly a professional role, and life identity involves both family life and personal life. For a workaholic, his or her work identity may be very salient while other identities are suppressed, whereas, for a life-oriented individual, his or her family or personal self-identities may be more salient than the work identity. Individuals who are trying to strike a balance between work and life may have both identities at a similar level of salience, and thus they may try to fulfill both role-based identities by simultaneously performing work and life activities to balance both identities. For example, an individual

who tries to balance work and life identities may listen to music, use social media, and/or interact with family members at home when working from home. Existing research on boundary management theory found that employees who were inclined to handle personal or family responsibilities during work time often held fairly equal levels of work identity and life identity (Kossek et al., 2012).

The four types of multitasking, characterized by social interactivity and medium, may be driven by different social identities. Mediated high-interactive multitasking, such as talking with friends or family members over the phone, may be driven by personal and family identity, whereas mediated low-interactive multitasking, i.e., listening to music or watching TV, is more related to personal leisure or less associated with family identity. Similarly, in-person high-interactive multitasking, i.e., taking care of family members and pets, may be driven by family identity. Given that the main task for these multitasking activities is work activities, combining these family or personal activities with work may be associated with a motivation to balance work identity and life identity. Thus, we hypothesize that the motivation to balance both work and life identities drives both high-interactive and low-interactive multitasking, electronic devices or in-person, while working from home.

Hypothesis 1: The balance of work-life identity is positively associated with the four types of multitasking while working from home.

Consequences of Multitasking

Building upon work-life boundary management theory, we further investigate how different types of multitasking are associated with work-life outcomes. Research on boundary management theory has examined the association between the integration management style and workers' well-being. Of multiple ways of conceptualizing and measuring work-life well-being, two are widely used in organizational research: work-life conflict (e.g., Kossek et al., 2006) and life satisfaction (e.g., Yasir et al., 2019). Building on this line of research, the present study focuses on two well-being indicators: life interference with work (Haymen, 2005) and life satisfaction (Diener, 1984), and we examine the mediating role of multitasking between work-life identity and workers' well-being.

Life interference with work, or life-work conflict, refers to the extent to which individuals' personal life and/or family activities interfere with their work responsibilities. When working from home, the workspace and the home converge and workers experience a blurred boundary between professional and personal lives (Kossek et al., 2006). Personal leisure, house chores,

and caregiving responsibilities at home may interfere with work duties, especially for those who integrate their professional and personal domains (Ashforth et al., 2000; Kossek et al., 2006). The integrated approach usually involves switching between professional and personal activities or engaging in both simultaneously, i.e., multitasking. Empirical research has consistently found that work-life integration is positively associated with life-work conflict (Bulger et al., 2007; Kossek et al., 2006; Matthews, 2007). Thus, it is possible that multitasking with personal activities when working from home will introduce greater life interference with work.

However, the impact of multitasking on work-life conflict may depend on the cognitive demands of different types of multitasking. To date, limited research has been conducted on the impact of different types of multitasking on work-life interference. As elaborated in the previous section, high-interactive multitasking, compared with low-interactive multitasking, requires a greater amount of cognitive resources due to its demands of behavioral responses with time pressure, less control over task switching, and greater emotional involvement (Benbunan-Fich et al., 2011; Wang et al., 2015). Evidence from an experimental study indeed showed that multitasking with a secondary interactive task led to a more than 30% decrease in the performance of the primary task (Wang et al., 2012). Lab experiments found that multitasking that required behavioral responses significantly dampened task performance (Hwang & Jeong, 2018), as additional cognitive and sensory resources were occupied by behavioral responses. Multitasking with less user control also reduced recognition memory in lab experiments (Hwang & Jeong, 2021), as a low level of user control may lead to greater attention demand. Further, a meta-analysis of 49 studies demonstrated that multitasking had a greater negative impact on cognitive outcomes when multitaskers had less control over the task (Jeong & Hwang, 2016).

Therefore, we propose:

Hypothesis 2: Compared to low-interactive multitasking, high-interactive multitasking during remote work is associated with greater life interference with work.

Life satisfaction is another important indicator of employee well-being widely studied in research on boundary management theory. Life satisfaction refers to the cognitive evaluation of the quality of life (Diener, 1984; Diener et al., 1999). Professional and personal activities, as the two key domains in many working adults' lives, are the main sources of individuals' judgment of their overall life satisfaction (for a review, see Eby et al., 2005). Only a few studies have examined the relationship between multitasking and satisfaction among employees, and they have yielded mixed results. For example, some studies have found a negative association between the preference for

multitasking and life satisfaction (Korabik et al., 2017), and a diary study among employees shows a negative relationship between daily multitasking and emotional satisfaction (Kirchberg et al., 2015). The mechanism can be explained by the increased cognitive demand of multitasking with professional and personal duties leading to frustration, thereby affecting life satisfaction (Kossek et al., 2006). Other studies, however, suggest that multitasking is positively related to life satisfaction (Weintraub et al., 2019), can increase job satisfaction among teachers (Jamian et al., 2020). The positive relationship between multitasking and life satisfaction can be explained by the flexibility to handle work and life duties simultaneously (S. C. Chen et al., 2017) and work-life integration is associated with enhanced life satisfaction (Yasir et al., 2019). Similar conflicting results have been observed in research of boundary management theory that examined the relationship between integration strategy and life satisfaction (Kossek et al., 2012). Given mixed results from previous studies, we propose a research question below.

RQ1: How is life satisfaction associated with the four types of multitasking activities?

Gender Difference

The role of gender in multitasking and work-life balance has been an intriguing research topic (Eby et al., 2005; Gutek et al., 1991; Williams, 2000). Multitasking research has found mixed evidence as to whether men and women perform multitasking differently or engage in different types of multitasking. Some found no gender difference in preferences for multitasking (Korabik et al., 2017). However, Buser and Peter (2012) finding suggested that when given a choice, women preferred multitasking less than men. Nonetheless, other studies found women reported engaging in more multitasking behavior than men (Offer & Schneider, 2011). Little research, however, has examined different multitasking choices between men and women employees when working from home.

Moreover, given that men and women often assume different domestic responsibilities (Chung & Van Der Lippe, 2020; Gabster et al., 2020), e.g., women are more likely or expected to carry out more caregiving responsibilities whilst remote working, men and women may perform different types of multitasking and encounter work-life conflict differently (Korabik et al., 2017), and experience different well-being outcomes (Westman et al., 2004). Though some studies already examined the gendered nature of remote work, most are based on qualitative data, such as case studies or interviews (e.g., Beauregard & Henry, 2009; Emslie & Hunt, 2009). To our knowledge, little

quantitative research has been conducted to examine whether the association between different types of multitasking and work-life outcomes differs for men and women workers when working from home. In the present study, we explore whether women and men differ in our hypothesized relationships and also whether there are differences between men and women on the key variables.

RQ2: Are there differences between men and women in key measures and hypothesized relationships in the present study?

Method

Data Collection and Participants

A total of 429 U.S. participants were recruited through a professional survey company Qualtrics in August 2020, with a balanced ratio of gender and ethnicities mirroring the ratios in the U.S. census (U.S. Census Bureau QuickFacts: United States, 2019). Given that the study is about working from home, participants had to meet two criteria: (1) were a full-time or part-time employee, and (2) were working from home (partially or fully) during the month when completing the survey. Among the 429 participants, the average age was 41.67 ($SD = 11.39$, mode = 40), 224 (52.2%) identified as female, and the majority were White (71.8%), Table 2 provides demographics and organizational profiles of the sample.

Measures

All questions included in the survey were randomized to minimize order effects.

Multitasking When Working From Home

The following introduction and definition of multitasking were presented on a separate page right before the multitasking questions.

We are going to ask you some questions about multitasking when working from home. Multitasking includes doing multiple things at the same time, such as listening to music and writing reports; and multitasking also includes switching back and forth from one activity to another, such as switching between writing reports and checking social media, or switching between doing household chores and writing reports. When we switch to another activity before completing the previous activity, it is considered multitasking.

Some people prefer to engage in multiple activities to make life more efficient, while some people prefer to do one thing at a time.

Table 2. Demographics of participants.

Demographics	Category	N = 429
Age	19–35	34.3%
	36–46	36.8%
	47–77	28.9%
Gender	Male	47.8%
	Female	52.2%
Ethnicity (multiple selections are possible)	White, non-Hispanic or Latino	71.8%
	Black or African American	10.7%
	Hispanic or Latino	14.7%
	Asian	8.6%
	Pacific Islander	0.5%
	Native American or Alaskan native	1.9%
	Others	0.5%
Education	High school	11.2%
	Associate degree	11.2%
	Bachelor's degree	44.5%
	Master's degree	28.7%
	Doctoral or equivalent	4.4%
Job Level	Entry-level	12.8%
	Senior level	21.4%
	Supervisory level	15.9%
	Managerial level	33.3%
	Executive level	11.2%
Employment status (multiple selections are possible)	Full-time	96.5%
	Part-time	3.7%
	Contractor	0.7%
Household	Live by myself	14.7%
	Live with family	57.6%
	Live with partner	25.2%
	Live with roommate	2.6%
Children in the household (multiple selections are possible)	No children	40.8%
	Live with children under 18	59.1%
	Live with children under 6	24.2%
Industry	Educational services	15.2%
	Professional, scientific or technical services	14.7%
	Information	10.3%
	Finance or insurance	8.9%
	Manufacturing	7.7%
	Health care or social assistance	7.2%
	Retail trade	3.7%
	Construction	3.0%
	Arts, entertainment or recreation	2.8%
	Transportation or warehousing	2.3%
	Other industries combined	24.2%

Participants were first asked to write down two work activities that took the most time when working from home.¹ Then, each work activity participants provided was auto-filled into the subsequent questions about *technology-mediated high-interactive multitasking*. For example, “When working on [work activity 1] at home, how often did you multitask with the following

¹This is an open-ended question asking participants to put two work activities that took the majority of their time when working from home. The most frequently mentioned work activities were writing e-mails, attending meetings, and preparing documents.

activities? (1) sending messages via phone or computer, (2) browsing social media, (3) talking on the phone or video calls with friends or family,” and *technology-mediated low-interactive multitasking* which included (1) listening to music/radio, and (2) watching TV/video. All questions used a five-point scale (1 = *Never*, 5 = *Always*). These multitasking questions were adapted from Q. Xu and Sundar (2016)’s multitasking study. These items were averaged to create two composite scores, respectively: *Technology-mediated high-interactive multitasking* ($M = 2.55$, $SD = 0.96$, $\alpha = 0.88$) and *technology-mediated low-interactive multitasking* ($M = 2.63$, $SD = 1.04$, $\alpha = 0.76$).

For each work activity, we also asked *in-person high-interactive multitasking*. For example, “When working on [work activity 1] at home, how often did you multitask with the following activities? (1) attending to the needs of adult family members, (2) attending to the needs of children, (3) attending to the needs of pets,” and *in-person low-interactive multitasking* which included (1) preparing meals and (2) handling household chores. All questions used a five-point scale (1 = *Never*, 5 = *Always*). The items were averaged to create two measures, respectively: *in-person high-interactive multitasking* ($M = 2.21$, $SD = 0.96$, $\alpha = 0.87$); *in-person low-interactive multitasking* ($M = 2.35$, $SD = 1.03$, $\alpha = 0.90$). The confirmatory factor analysis (CFA) factor loadings and model fit indices are in the Appendix.²

Balance of Work-Life Identity

Four items were from the scale of work and family identities conducted by Kossek et al. (2012). On a five-point scale (1 = *strongly disagree* to 5 = *strongly agree*), participants were asked to indicate their (dis)agreement with the four statements, (1) people see me as focused on my work, (2) I invest a large part of myself in my work, (3) People see me as highly focused on my personal life or family duties, and (4) I invest a large part of myself in my personal life or family duties. Statement one and two were averaged to create an index for *work identity* ($M = 4.12$, $SD = 0.75$, $\alpha = 0.73$) and statement three and four were for *life identity* ($M = 3.93$, $SD = 0.91$, $\alpha = 0.87$). We used the equation below to compute the balance of work-life identity. The sign of | | indicates the absolute value of the discrepancy between work identity and life identity,

²Following reviewers’ suggestions, we ran EFA and CFA for the multitasking scales. The EFA results indicated a two-factor model of the multitasking scale: mediated versus in-person. We further tested two competing CFA models: the two-factor model based on the EFA results versus and four-factor model we proposed in this paper, and the four-factor model performs better than the two-factor model: RMSEA decreases from 0.096 (two-factor) to 0.062 (four-factor), CFI increases from 0.942 (two-factor) to 0.98 (four-factor), TLI increases from 0.923 (two-factor) to 0.968 (four-factor), and SRMR decreases from 0.047 (two-factor) to 0.030 (four-factor). Additionally, we conducted the likelihood ratio test to formally test the model fit (chi-square values) of the two-factor model and the four-factor model (Holbert & Grill, 2015). The results of the likelihood ratio test indicate that the four-factor model significantly improves the model fit. Thus the four-factor model of multitasking scales is preferred.

and the reversed value of this distance or discrepancy was imputed by subtracting it from five, which is the largest possible value based on the five-point scale for this question.

$$\text{Balance of work-life identity} = 5 - |\text{work identity} - \text{life identity}|$$

The greater the value of the balance of work-life identity, the smaller the discrepancy between the work identity and life identity values, indicating a similar salience level of the two identities. The average balance of work-life identity was 4.32 ($SD = 0.76$).

Life Interference with Work

This scale of life interference with work was a dimension of the work-life balance scale from Haymen (2005). On a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*), participants were asked to indicate their (dis)agreement with four statements, “Personal or family life drains me of energy for work,” “My personal or family life makes me too tired to be effective at work,” “My work suffers because of my personal or family life,” and “It is hard for me to focus on work because of personal or family matters.” The average of the four items was 2.02 ($SD = 1.06$, $\alpha = 0.92$).

Life Satisfaction

We measured life satisfaction with a widely used, validated scale (Diener, 1984; Valenzuela et al., 2009). On a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*), participants were asked to think of a typical day of working from home over the past month, and indicate their (dis)agreement with five statements: “In most ways my life is close to my ideal,” “The conditions of my life are excellent,” “I am satisfied with my life,” “So far, I have the important things I want in life,” and “If I could live my life over, I would change almost nothing.” The average of *life satisfaction* among participants was 3.66 ($SD = 0.89$, $\alpha = 0.88$).

Results

First, the bivariate correlations among the variables are summarized in Table 3 to provide an overview of their relationships, along with the mean differences between men and women.

Hypothesized Path Models

Two hypothesized path models with life interference with work and life satisfaction respectively as dependent variables were tested with STATA SE 16. Path models were fitted using the maximum likelihood estimator (ML).³

³Following the reviewer’s suggestion, we ran two full SEM models but the models did not converge.

Table 3. Inter-scale correlations among variables and mean differences between men and women.

	1	2	3	4	5	6	7	Men (n = 205) Mean (SD)	Women (n = 224) Mean (SD)
1.Balance of work-life identity								4.42(.68)	4.23(.82)*
2.Technology-mediate high-interactive multitasking	0.11*							2.62(1.02)	2.47(.88)
3.Technology-mediate low-interactive multitasking	0.09	0.67***						2.64(1.07)	2.61(1.01)
4.In-person high-interactive multitasking	0.16**	0.60***	0.47***					2.26(.99)	2.16(.93)
5.In-person low-interactive multitasking	−0.02	0.70***	0.55***	0.65***				2.28(1.07)	2.41(1.00)
6.Life interference with work	−0.04	0.30***	0.19***	0.32***	0.24***			2.04(1.09)	1.99(1.03)
7.Life satisfaction	0.15**	0.15**	0.09	0.22***	0.09	−0.17***		3.75(.86)	3.58(.91)*

Note: $N = 429$. *** $p < .001$. ** $p < .01$. * $p < .05$.

Two path models all show good model fit with the data, $\chi^2(1) = 4.79$, $p = .03$, CFI = .996, RMSEA = .09, TLI = .94 (life interference with work as the dependent variable); $\chi^2(1) = 3.96$, $p = .05$, CFI = .997, RMSEA = .08, TLI = .95 (life satisfaction as the dependent variable). The χ^2 is sensitive to sample size, and for models with more cases (400 or more), the χ^2 is almost always statistically significant (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Other SEM fit indices indicate excellent model fit, except RMSEA values which are below .10 but above .05 in the two models, which is an indication of a fair fit, but RMSEA tend to be inflated for models with smaller degrees of freedom which is one in this model (F. Chen et al., 2008; Kenny et al., 2015). All the standardized coefficients in the hypothesized models were presented in (Figures (1,2)).

We hypothesized a balance of work and life identities would be associated with the four types of multitasking (H1), which was partially supported. Results showed that H1 was partially supported in that the balance of work and life identities were only significantly and positively associated with technology-mediated high-interactive multitasking and in-person high-interactive multitasking when working from home, with path unstandardized coefficients: $b = .13$, $p = .03$, $b = .21$, $p < .001$, respectively. The associations between a balance of work-life identity and low-interactive multitasking, technology-mediated or in-person, were not significant.

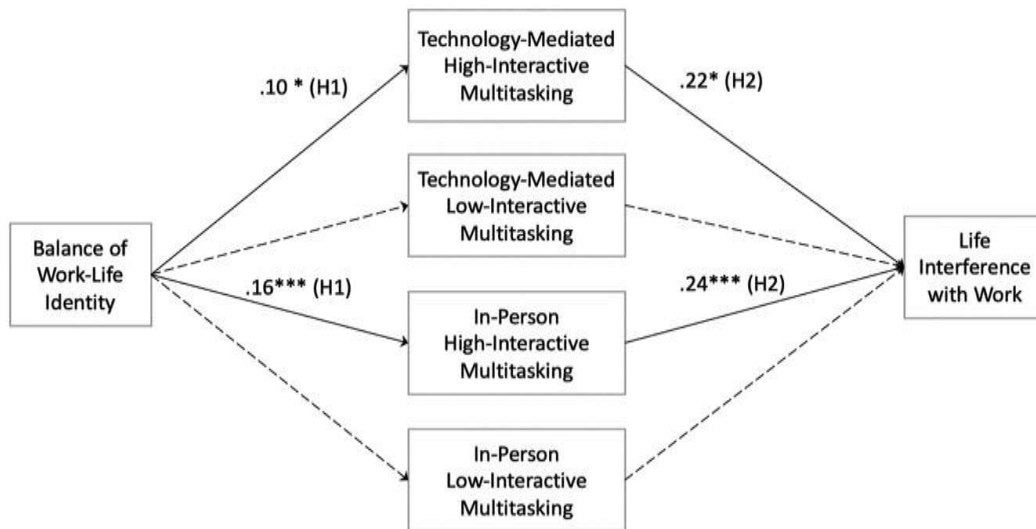


Figure 1. Standardized coefficients for the hypothesized model with life interference with work. Note: $N = 429$. *** $p < .001$. ** $p < .01$. * $p < .05$. Dotted lines indicate insignificant paths. Correlation among the four multitasking variables are included in the model but not shown here for brevity.

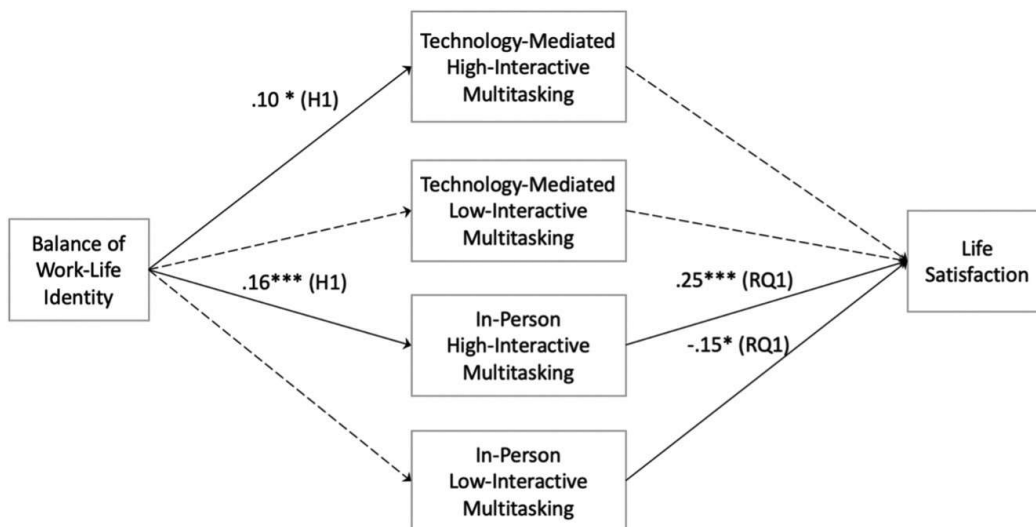


Figure 2. Standardized coefficients for the hypothesized model with life satisfaction. Note: $N = 429$. *** $p < .001$. ** $p < .01$. * $p < .05$. Dotted lines indicate insignificant paths. Correlation among the four multitasking variables are included in the model but not shown here for brevity.

We also proposed that high-interactive multitasking, technology-mediated or in-person, would be correlated with higher life interference with work, compared to low-interactive multitasking, technology-mediated and in-person, multitasking (H2). This hypothesis was supported by the data, as technology-mediated high-interactive multitasking was positively and significantly associated with life interference with

work ($b = .24$, $p = .003$), whereas the technology-mediated low-interactive multitasking did not have a significant association. Similarly, in-person high-interactive multitasking was positively and significantly associated with life interference with work ($b = .27$, $p < .001$), whereas the in-person low-interactive multitasking did not show a significant association.

We asked whether the four different types of multitasking would be associated with life satisfaction (RQ1). Results showed that in-person high-interactive multitasking was positively correlated with life satisfaction ($b = .25$, $p < .001$), whereas in-person low-interactive multitasking was negatively associated with life satisfaction ($b = -.13$, $p = .036$). Technology-mediated multitasking, high interactive or low-interactive, did not have any significant association with life satisfaction.

Multi-group Analysis of Gender

Further, we examined whether there were any differences in the hypothesized relationships between male and female employees (RQ2). A multi-group analysis was conducted to compare two nested models: a model wherein paths were constrained to be the same was contrasted with an unconstrained model.⁴

For the path models with life interference with work as the dependent variable, constraining the structural parameters in the model to be equal across the two groups (men and women) results in a chi-square value: $\chi^2(26) = 51.32$, $p = .002$. The goodness of fit for the model with unconstrained structural parameters was: $\chi^2(13) = 27.96$, $p = .009$. Based on chi-square table, the difference between the two chi-square value, $51.32 - 27.96 = 23.36$, exceeds the critical value of 22.36 when $df = 13$ at the .05 level. Thus, the model with unconstrained structural parameters was preferred, and other model fit indices showed a good model fit, CFI = 0.98, RMSEA = 0.07, TLI = 0.96. The multi-group results indicated that males and females shared similar significant results in terms of the positive associations between the balance of work-life identity and in-person high-interactive multitasking, and between in-person high-interactive multitasking and life interference with work. The multi-group analysis also revealed a difference between the two groups: for males, the associations between the balance of work-life identity and the technology-mediated high-interactive multitasking ($b = 0.3$, $p = .002$) and technology-mediated low-interactive multitasking ($b = 0.34$, $p = .001$) were positive and significant, whereas, for females, these

⁴All path constraints were released except the correlations among the four multitasking variables, because we do not hypothesize these correlations to differ for men and women.

associations were not significant. In addition, the positive association between technology-mediated high-interactive multitasking and life interference with work was significant only for females ($b = 0.28$, $p = .02$). Multi-group analysis results are presented in Figure 3.

For the path models with life satisfaction as the dependent variable, the model with unconstrained structural parameters across men and women has a better model fit ($\chi^2(13) = 27.65$, $p = .01$) than the gender constraint model ($\chi^2(26) = 53.46$, $p = .001$), and the difference, $\chi^2(13) = 25.81$, is statistically significant at a .05 level, based on the chi-square table. Thus, the model with unconstrained structural parameters was preferred, and it showed a good model fit: CFI = 0.99, RMSEA = .07, TLI = 0.97. The multi-group results indicated that males and females shared similar significant results in terms of the positive association between in-person high-interactive multitasking and life satisfaction. These results are presented in Figure 4.

Independent t-tests were performed to analyze the mean differences of the key variables between men and women. Results indicated that men experienced a higher level of life satisfaction ($t = 2.53$, $p = .01$) and a balance of work-life identity than women ($t = 2.06$, $p = .04$), but the mean differences of four types of multitasking behaviors and life interference with work between men and women were not statistically significant.

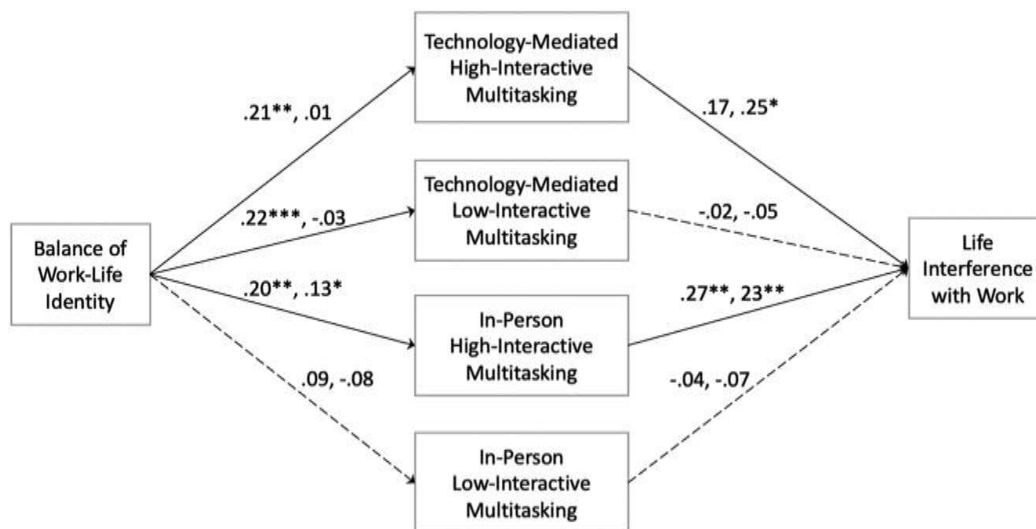


Figure 3. Multi-group analysis results for males vs. females in the life interference with work model. Note: $N = 429$. *** $p < .001$. ** $p < .01$. * $p < .05$. The first numbers are from the male participants and the second numbers are from the female participants. Coefficients are standardized. Correlation among the four multitasking variables are included in the model but not shown here for brevity.

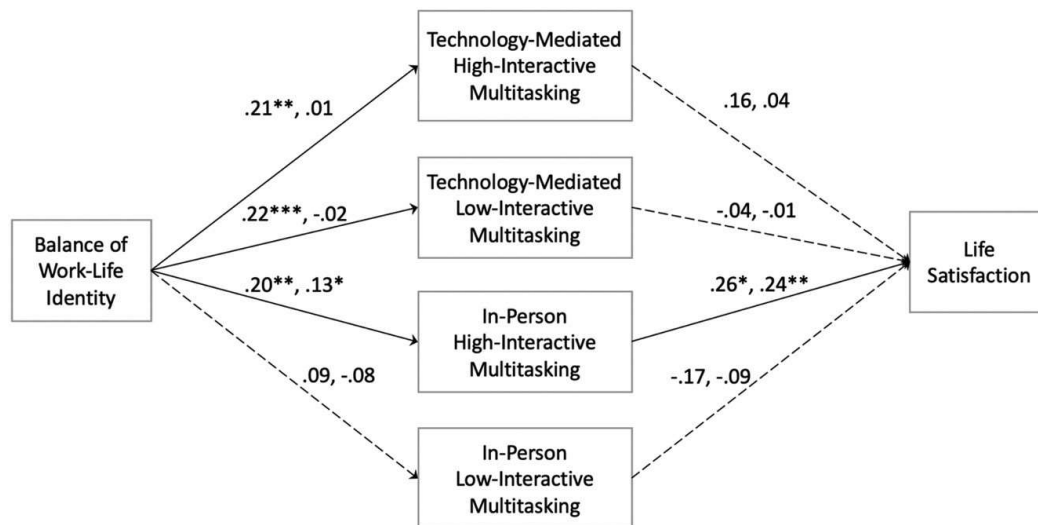


Figure 4. Multi-group analysis results for males vs. females in the life satisfaction model. Note: $N = 429$. *** $p < .001$. ** $p < .01$. * $p < .05$. The first numbers are from the male participants and the second numbers are from the female participants. Coefficients are standardized. Correlation among the four multitasking variables are included in the model but not shown here for brevity.

Discussion

Multitasking exemplifies the multiple challenges faced by employees when working from home. It is the product of too many goals but not enough time, and pressures to balance both work and life. This study examined the antecedent and consequences of multitasking. The contribution of this study is three-fold. First, it is among the first studies to explicate and differentiate different types of multitasking during remote work according to their medium and social interactivity, based on cognitive resource theories (Wang et al., 2015). Thus, the present study provides a more nuanced understanding of multifaceted multitasking and the wide variations in resource demand among tasks. Second, bridging the multitasking literature and boundary management theory, we examined the antecedent and consequences of multitasking. Balancing work-life identity, a previously under-explored antecedent of multitasking, expands our understanding of the motivation for multitasking: it is not simply about gaining stimulation or emotional gratification, it is also aiming to achieve the balance of multiple social identities (S. Xu & Wang, 2021). Adding to the literature on multitasking and boundary management theory, we further examined the consequences of multitasking on life interference with work and life satisfaction. The results indicated that different multitasking behaviors have differential consequences. Last but not least, we explored the gender difference of the proposed relationships and found different patterns of multitasking between men and women.

Indeed, the balance of work-life identity was associated with different types of multitasking: results indicated that the balance of work-life identity was associated with high-interactive multitasking behaviors, but not low-interactive multitasking. This is consistent with social identity theories in that social identities are formed through social relationships (e.g., Tajfel et al., 1979). Interacting with people from different social groups, such as family, friends, or coworkers, gives individuals a sense of social identity. High-interactive multitasking during work, such as interacting with family members at home or with others via electronic media, was associated with a balance of work-life identities. Low-interactive multitasking, such as listening to music, watching TV, or doing household chores, was not associated with a balance of work-life identity. However, men and women may have different experiences in terms of balancing work and life identities with multitasking, which will be elaborated in the following sections.

As predicted, compared with low-interactive multitasking, high-interactive multitasking, technology-mediated or in-person, distracts more cognitive resources from work and thus leads to greater interference with work. These results are consistent with the prediction from the cognitive dimensions of multitasking (Wang et al., 2015): Compared with low-interactive multitasking, high-interactive multitasking, with a higher level of interactivity with social members, requires behavioral responses, affords employees less control over task switching, and has greater emotional engagement. Therefore, high-interactive multitasking demands more cognitive resources and results in greater interference with work, whereas low-interactive multitasking, such as listening to music, watching TV, and handling household chores, seems harmless in terms of life-work interference. The results provide practical implications for guiding multitasking choices when working from home. If multitasking is inevitable when working from home, strategically reducing high-interactive multitasking during work, such as interacting with others, technology-mediated or in-person, can minimize distraction and interference with work tasks.

Though in-person high-interactive multitasking interfered with work, it also enhanced life satisfaction. This seemingly paradoxical result can be explained by the flexibility brought by remote work to interact with partners, children, and/or pets at home during work time. Evidence from previous research has shown that family involvement or family support is significantly associated with life satisfaction (e.g., Beutell & Wittig-Berman, 1999; Haar & Roche, 2010; Higgins et al., 1992). Handling both work and life at the same time when working from home may decrease work efficiency, but can increase family involvement and life satisfaction, which may motivate workers to be more productive in the long run (Wang et al., 2015). In other words, being able to take care of family members at home during remote work provides emotional

benefits to employees. Therefore, when establishing remote work guidelines or recommendations for employees regarding multitasking, companies need to consider both the pros and cons of in-person high-interactive multitasking. It would be wise to consider the long-term benefits, and not simply the short-term effects of multitasking during remote work.

Taken together, the results contribute nuances to boundary management theory. Multitasking is an integration strategy to manage professional and personal roles, but not all multitasking is created equal: high-interactive multitasking is associated with the balance of multiple identities and leads to greater interferences with work, whereas low-interactive multitasking is not. Thus, different ways to integrate work and life may not exert the same level of influence on work-life balance and work-life conflict. There are tremendous opportunities for developing future studies on boundary management theory to further explicate various types of integration strategies and their different impacts on work-life well-being, and this study serves as the first step toward that development.

The Gendered Nature of Remote Working and Multitasking

Finally, results showed that men and women performed similar levels of the four types of multitasking activities when working from home, but their perceptions about these multitasking activities were different, as they multitasked for different reasons and experienced different consequences. Specifically, men's perception of work-life identity balance was positively associated with *both* interacting with family members in-person and with technology-mediated leisure activities online during work, whereas women's perceived work-life identity balance was only associated with taking care of families during work. These findings imply different perceptions of work-life balance between men and women. First, female workers consider taking care of family members when working from home as an essential and only way to balance work and life identities, whereas men consider the "me time," such as using social media and listening to music when working from home, an important part of their work-life identity balance. This is not surprising, as the normative roles prescribed to women and men in societies are gendered: Working women are still expected to take the bulk of caregiving for children and families, while men are expected to only focus on their work (Bianchi et al., 2012; Chung & Van Der Lippe, 2020; Hook, 2006). This external demand and the social norm have been shown to shape women and men's perception of work-life identity balance in this study. The findings also echo what Keene and Quadagno (2004) proposed, "they (women) may feel that family is an important priority and therefore are accustomed to having little personal time. Men apparently do not share these expectations" (p. 17), as

Keene and Quadagno study showed that men were more likely to report feeling imbalances between work and life when they have no personal time, but women who had no personal time did not report such imbalances.

In addition, results from this study showed that women's level of life satisfaction was significantly lower than men's during the period of working from home. It is possible that with the expectation for women to fulfill household and caregiving responsibilities when working from home, women may experience increased stress from both professional and domestic spheres (Chung & Van Der Lippe, 2020), leading to a decreased level of life satisfaction. Future studies can continue exploring the mechanism of men's and women's life satisfaction when working from home.

Together, findings suggest that men and women experience work-life identity balance in different ways, develop different multitasking strategies to achieve such balance, and undergo different outcomes. Because of pre-existing views on gender roles in society, working from home may reinforce gender bias in the labor market instead of reducing it, as women are expected to expand their household and caregiving burdens when working from home. Thus, the flexibility provided by remote work may hinder rather than support gender equality (Chung & Van Der Lippe, 2020). We suggest changes in the gendered norms and policies at the societal level. For example, evidence has shown that increasing well-paid ear-marked paternity leaves increases men's involvement in childcare and housework not only during the leave but also many years after (Nepomnyaschy & Waldfogel, 2007). Such policies may help reduce gender division in childcare and domestic works, consequently shifting the gender norms and biases in society. At the organizational and individual levels, managers and employees should be aware of how their own expectations of remote work are shaped by the prevailing social norms, and further question some of the gendered assumptions.

Limitations, Future Research, and Conclusion

It is important to recognize the limitations of this study. First, the data for this study was collected during the COVID-19 pandemic, so results from this study may only reflect the patterns of multitasking and well-being among remote workers during the pandemic. Careful research must be directed to compare how people work from home versus how they work from home during the pandemic. Second, the hypothesized path models starting from the balance of work-life identity to multitasking behaviors and to life and work outcomes are based on cross-sectional data, so they do not warrant clear causal relationships. Although the current study examined the model with the balance of work-life identity as a predictor of multitasking, the reverse causality is also possible – multitasking can lead to the balance of work-life identity. The same applies to the relationships of multitasking with

life interference with work and with life satisfaction. The best way to verify causality association is a longitudinal investigation. Longitudinal data collection is in progress for the next study.

Third, whether the children were also taking online classes at home, or the status of children's school (open or closed) are important factors that influence parents' multitasking patterns when working from home during the pandemic. Future studies should include these variables for a more nuanced understanding of parents' multitasking patterns and well-being during the pandemic. Fourth, the measure of technology-mediated high-interactive multitasking, i.e., responding to text, phone calls, and browsing social media, may involve both personal and work activities. Future studies can distinguish the purpose of multitasking, e.g., for work, personal, or family purposes. Fifth, the measure of work-life identity balance is operationalized as the reversed, absolute value of the discrepancy between work and life identity values. This operationalization is based on our definition of balance of work-life identities and the focus of this paper. By taking the absolute value we did not consider which identity is more dominant than the other. Future studies can take a different perspective to examine the salience of different identities and how the different levels of salience may be associated with different multitasking choices when working from home. Additionally, the current study did not measure the voluntariness or autonomy of multitasking, which was found to be significantly associated with the affective outcome of multitasking (Bachmann, Grunschel, & Fries, 2019). Future studies should consider whether remoter workers voluntarily multitask or they feel forced to multitask when working from home.

Lastly, there is a need for more objective or accurate measures for multitasking behaviors and life interference with work. We opted for treating multitasking variables as the manifest variables to be aligned with the current state of this line of research (Baumgartner et al., 2014; Gil de Zúñiga et al., 2015; Hwang et al., 2014; Ophir et al., 2009; Pea et al., 2012; Wang et al., 2015; Q. Xu & Sundar, 2016), but future research should make a conceptual and operational refinement to multitasking for more robust empirical testing. The current study also relied on self-reports to measure how employees multitask when working from home and their perceived life interference with work. While objective measures of these concepts are not available, the self-reported measure can be a proxy to gauge the impact of different types of multitasking on the perceived conflict between life and work, but it limits its potential to make definitive statements. Future research should include objective or more accurate assessments of multitasking and life interference with work, such as computer and cellphone logging data (Mark et al., 2014), experience sampling measures (Kirchberg et al., 2015), and job performance ratings from supervisors (Kossek et al., 2006).

Despite its limitations, the present study is among the first to explicate and differentiate different types of multitasking when working from home, and to explore the antecedent and consequences of different types of multitasking during the pandemic, based on boundary management theory. The results of the current study indicated that to strike a balance between work and life identities, employees engaged in different types of multitasking, which is associated with greater interference with work but a higher level of life satisfaction. Compared with women who multitasked by taking care of others at home to achieve a work-life identity balance, men engaged in a variety of multitasking activities during work, including looking after family members and personal leisure on media.

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Appendix

CFA Factor Loadings of the Four-Factor Multitasking (MT) Scales

Items	Standardized factor loading			
	Technology-mediated high-interactive MT	Technology-mediated low-interactive MT	In-person high-interactive MT	In-person low-interactive MT
Messaging	0.72			
Social media	0.79			
Phone/ video calls	0.87			
Music		0.58		
TV		0.71		
Adult family members			0.79	
Children			0.67	
Pets			0.7	
Meals				0.88
Chores				0.94
Goodness of Fit Index				
<i>Chi-square value</i>		75.96 (29)		
<i>RMSEA</i>		0.062		
<i>CFI</i>		0.98		
<i>TLI</i>		0.968		
<i>SRMR</i>		0.030		

Note. Correlations among the four factors are included in the model. Correlation paths among items or cross loadings are not allowed.

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