

WORKPLACE INTRUSIONS

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To What Do I Owe This Visit?

The Drawbacks and Benefits of In-Role and Non-Role Intrusions

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Abstract

Workplace intrusions—unexpected encounters initiated by another person that disrupt an individual’s work—are generally characterized as negative experiences that deplete resources, increase role and information overload, and promote strain. In contrast, our research argues that intrusions may also provide benefits to the employees who are intruded upon. Taking a multi-study approach, we investigate how intrusions impact the extent to which employees engage in their own work—work engagement—and the extent to which they engage in work with others—collaboration. We also investigate the indirect effects of intrusions on employees’ task-focused and person-focused citizenship behavior through these mechanisms. We tested our predictions with a within-person experimental critical incident study (Study 1), an experiment (Study 2), and an experience sampling methodology study with a sample of scientists involved in research and development (Study 3). Our research investigates the dynamics of various types of workplace intrusions, with results suggesting that intrusions may lead to beneficial employee outcomes in addition to the adverse outcomes previously demonstrated in the literature. Given the ubiquitous nature of intrusions in organizations, our findings have both theoretical and practical significance.

Keywords: intrusions; interruptions; collaboration; engagement; experience sampling methodology

TO WHAT DO I OWE THIS VISIT?

THE DRAWBACKS AND BENEFITS OF IN-ROLE AND NON-ROLE INTRUSIONS

“My gut says that, for us, it’s still very important to physically be in touch with one another because collaboration isn’t always a planned activity.” – Tim Cook, CEO of Apple, in reference to returning to the workplace post-2020 coronavirus pandemic

The popular press has dubbed the office an “interruption factory” (Fried, 2010), with intruders playing the role of “time bandits” (Brown, 2014). Confirming this proposal, scholars estimate that employees often face dozens of daily interruptions, which can occupy upwards of 2 hours per day (Spira & Feintuch, 2005; Wajcman & Rose, 2011). Scholars have theorized that interruptions cause many negative consequences, including feelings of anxiety and stress, insufficient time to complete assigned tasks, and reduced work engagement (Jett & George, 2003). Empirical research similarly portrays interruptions in a negative light, with results indicating that interruptions may contribute to depletion (Freeman & Muraven, 2010), strain (Fletcher, Potter, & Telford, 2018; Lin, Kain, & Fritz, 2013; Wilkes, Barber, & Rogers, 2018), time pressure (Baethge & Rigotti, 2013; Perlow, 1999; Sonnentag, Reinecke, Mata, & Vorderer, 2018), and role and information overload (Kirmeyer, 1988; Speier, Valacich, & Vessey, 1999). In sum, the literature has tended to characterize interruptions as negative experiences.

Although this general characterization of interruptions is intuitive, it is potentially misleading. Scholars have highlighted that interruptions take many forms (e.g., intrusions, breaks, and distractions),¹ and that some forms may not be wholly detrimental. Specifically, Jett and George (2003) theorized that *intrusions*—unexpected encounters initiated by another person that interrupt an individual’s work, bringing it to a temporary halt—may also be associated with beneficial outcomes. Despite their assertion, the limited empirical research on intrusions has

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3 focused on their detrimental outcomes, leading to a relatively narrow view of intrusions.² We
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5 suggest that the key to reconciling theory and empirics around this phenomenon is recognizing
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7 that intrusions, like interruptions, come in multiple forms. We also suggest that identifying the
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9 benefits of intrusions will be facilitated by considering outcomes that go beyond immediate task
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11 performance.
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15 The portrayal of intrusions as detrimental has been partially based on the
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17 conceptualization of intrusions as incidents that are not work-related, or *non-role*, such as small
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19 talk (Jett & George, 2003; Perlow, 1999). Yet, in the growing knowledge economy, many jobs
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21 require frequent and unscheduled interactions with colleagues throughout the workday (Brown,
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23 2014; Fried, 2010). Consider, for example, a researcher who is intruded on by a colleague with
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25 new information regarding a joint research project or to request an update. In this case, the work-
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27 related, or *in-role*, intrusion might renew the researcher's interest in the project and provide a
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29 challenge that injects energy into the researcher's efforts. Although the intrusion may
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31 temporarily disrupt the flow of work, it also provides an opportunity to interact more
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33 collaboratively with a colleague (Okhuysen & Eisenhardt, 2002; Perlow, 1999). In this example,
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35 the negative outcomes associated with task switching (e.g., Freeman & Muraven, 2010;
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37 Kirmeyer, 1988; Perlow, 1999) may be accompanied by additional collaboration with colleagues
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39 and a renewed sense of work engagement, which likely have important ramifications for
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41 employee behavior moving forward. In sum, an examination that considers multiple types of
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43 intrusions may reveal why and how intrusions can be both detrimental and beneficial.
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50 The incomplete understanding of intrusions can also be attributed to scholars' focus on a
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52 relatively narrow set of outcomes, namely on how interruptions (and, by extension, intrusions)
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54 impact in-role performance (e.g., Couffe & Michael, 2017; Freeman & Muraven, 2010; Lin et
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3 al., 2013; Perlow, 1999). Although in-role performance is a critical outcome of workplace
4 intrusions (Jett & George, 2003), an unfortunate side effect of this narrow focus is a failure to
5 consider how intrusions affect other crucial aspects of employees' performance (Puranik,
6 Koopman, & Vough, 2020). Specifically, we suggest that employees' extra-role performance is a
7 salient yet previously overlooked outcome of intrusions—a point that was echoed in a recent
8 review of the literature (Puranik et al., 2020). Given the importance of discretionary behavior to
9 organizational effectiveness (Borman & Motowidlo, 1997; Dalal, 2005; Rotundo & Sackett,
10 2002), this is potentially a critical oversight. We extend the literature by investigating the indirect
11 effect of non-role and in-role intrusions on both task-focused and person-focused citizenship
12 through the mechanisms of work engagement and collaboration. Taken together with prior
13 research addressing the effects of intrusions on in-role performance, our investigation provides a
14 more nuanced and complete picture of the impact of intrusions on employee performance.

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31 Our research builds and tests theory about workplace intrusions that extends beyond the
32 immediate consequences of diverted attention to consider a broader range of daily employee
33 consequences. Drawing on Jett and George's (2003) model of general workplace interruptions,
34 we build and test a theoretical model that characterizes intrusions as occurrences that bring
35 benefits in addition to drawbacks. We outline the unique effects of two distinct types of
36 intrusions on employees' work engagement and collaboration. In turn, we propose these two
37 mechanisms will have important implications for employees' task-focused and person-focused
38 citizenship behavior (see Figure 1). We theorize that although some intrusions (i.e., non-role)
39 will reduce work engagement, others (i.e., in-role) can provide a meaningful challenge for
40 employees, instilling additional energy and motivation to engage in their work and provide task-
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oriented help to others. In addition, we predict that both types of intrusions can facilitate collaborative interactions, culminating in increased citizenship behavior toward coworkers.

Although the level of intrusions employees experience may vary widely from day-to-day (Kirmeyer, 1988), previous research on intrusions has largely relied on between-person investigations. To provide insights that more closely reflect employees' day-to-day experiences, we first investigated these dynamics in Study 1 using experimental experience sampling methodology (ESM) with a daily critical incident approach to investigate employees' reactions to specific intrusions. In Study 2 we tested our predictions with an experiment. In Study 3 we tested our full theoretical model using a within-person approach that utilized ESM to capture the impact of early-day intrusions on subsequent employee attitudes and behaviors.

Insert Figure 1 about here

Our research makes several theoretical contributions. First, we build on workplace intrusions theorizing (e.g., Jett & George, 2003), which suggests that intrusions may provide both costs and benefits to employees. We do so by identifying mechanisms through which intrusions lead to task- and person-focused citizenship behavior. Importantly, our research does not discount the potential detriments of intrusions that have been identified in the literature. Rather, our research adds to the literature by identifying a more inclusive range of benefits and burdens that accompany intrusions. Second, we build theory on intrusions by identifying two broad types of intrusions that employees are likely to face on a regular basis—non-role and in-role intrusions—thereby providing a more comprehensive understanding of intrusions. Third, our multi-study approach sheds light on the mechanisms and daily behavioral implications of

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intrusions in a way that could not be extrapolated from existing work. Finally, we contribute to practice by providing novel insights into the burdens and benefits of intrusions. These insights may help managers and organizations to focus on minimizing the burdens while enhancing the benefits. Given the impact of intrusions on important employee behaviors, these findings should be of interest to organizations and their employees.

THEORY DEVELOPMENT**Types of Intrusions**

Prior research has positioned intrusions within the broader literature on interruptions—an umbrella construct referring to incidents that impede or delay progress on work tasks (Jett & George, 2003). Intrusions have two key characteristics that distinguish them from other constructs that fall under this umbrella: (1) they are initiated by other people and (2) they are directed at a specific referent. Notably, intrusions stand in contrast to the two other primary types of interruptions that have been highlighted in the literature—breaks and distractions. Breaks are interruptions initiated by the self, which include events such as going to get coffee. Distractions are typically due to environmental stimuli, such as an exceptionally loud copy machine, and are not necessarily initiated by another person (Jett & George, 2003).

Jett and George (2003) characterized an intrusion as an unexpected encounter initiated by another person that interrupts an individual's work, bringing it to a temporary halt. A work intrusion might consist of a colleague stopping by to make small talk, request an update on task progress, or assign a new work task. One key factor that distinguishes a work intrusion from other forms of workplace communication is that it creates a "pause" in an employee's task. Thus, interactions such as chatting with somebody in the hall or having a conversation in the breakroom would not be considered intrusions. Importantly, our investigation of intrusions

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3 focuses on the experience of the person being intruded upon. By definition, the intruding party is
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5 not experiencing an intrusion because they are not subjected to an *unexpected* break in their work
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7 continuity initiated by *somebody else*.
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10 Despite a lack of empirical research that explicitly addresses intrusions as a specific type
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12 of interruption (for an exception see Lin et al., 2013), the operationalization of “interruptions” in
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14 several studies has captured aspects of intrusions. For instance, a field study with radio
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16 dispatchers examined the impact of “interruptions” that forced the dispatchers to either put their
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18 current work aside or work on multiple tasks concurrently. These incidents led to greater role
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20 overload and increased coping actions, such as spending less time than usual on core job tasks or
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22 providing less individualized attention to those seeking assistance (Kirmeyer, 1988). Similar
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24 results have been found in laboratory experiments. One such study found that interrupting
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26 participants as they neared the completion of a task led to increased depletion and decreased
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28 performance (Freeman & Muraven, 2010). In addition, a qualitative investigation of engineers
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30 revealed that when colleagues disrupted them too frequently, the engineers expressed difficulty
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32 in completing their work assignments (Perlow, 1999). Relatedly, Parke, Weinhardt, Brodsky,
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34 Tangirala, and DeVoe (2018) found that interruptions diminished the effectiveness of time
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36 management. Although all of these studies used the term “interruptions,” their conceptualization
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38 and operationalization of the construct overlapped with Jett and George’s (2003) characterization
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40 of “intrusions.”
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46 In general, empirical research has focused on situations in which an intrusion increases
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48 perceived workload yet has little or no apparent benefit for the intruded-upon party (e.g.,
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50 Freeman & Muraven, 2010; Kirmeyer, 1988). In a review of the literature, Jett and George
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52 (2003) observed that intrusions have uniformly been treated as the cause of “insufficient time to
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3 perform time-sensitive tasks, stress or anxiety associated with heightened feelings of time
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5 pressure, and/or a disturbance in a person's state of total involvement in the task being
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7 performed" (p. 496). In this sense, intrusions have been portrayed as acting in ways similar to
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9 hindrance stressors—job demands that interfere with or hinder one's ability to achieve valued
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11 goals (Cavanaugh, Boswell, Roehling, & Boudreau, 2000).
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15 Yet, research has concluded that job demands are not always hindrances. They can also
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17 be perceived as challenges—rewarding work experiences that provide an opportunity for work-
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19 related personal growth and goal achievement (Cavanaugh et al., 2000). Likewise, Jett and
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21 George's (2003) theoretical model of interruptions suggests that although intrusions may break
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23 work continuity, they also introduce potentially beneficial opportunities for the intruded-upon
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25 employees. Despite allowing for these benefits, their framework does not provide an in-depth
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27 treatment of the mechanisms for these positive implications. Accordingly, we extend their
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29 framework by building theory around our proposal that whether intrusions are beneficial or
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31 detrimental largely depends on the type of intrusion and the outcome of interest.
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36 Although scholars have yet to identify a taxonomy of intrusions, two broad classes of
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38 intrusions emerge from a review of the literature—non-role and in-role. *Non-role intrusions*
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40 occur when an employee who is focused on a work-related task experiences an unexpected
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42 encounter in which a colleague wants to talk about a non-work topic. For example, a colleague
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44 stopping by an employee's desk for a "personal visit" (Jett & George, 2003) or a "social
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46 conversation" (Perlow, 1999) would constitute non-role intrusions. *In-role intrusions* occur when
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48 an employee who is focused on a work-related task experiences an unexpected encounter in
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50 which someone at work wants to talk about the employee's new or existing tasks. For example, a
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52 supervisor knocking on an employee's door to assign "new and urgent work" (Perlow, 1999) or a
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3 colleague stopping by an employee's desk to "gather real-time information" on current task
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5 assignments (Jett & George, 2003) would constitute in-role intrusions. We propose these two
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7 types of intrusions broadly capture the predominant forms of workplace intrusions identified in
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9 the literature (Holmes & Stubbe, 2015; Kaufmann & Beehr, 1986; Kirmeyer, 1988; Perlow,
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11 1999).

Intrusions, Work Engagement, and Task-Focused Citizenship

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17 We first turn to Jett and George's (2003) theoretical framework to explore whether
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19 intrusions can lead employees to more fully engage with *their* work. *Work engagement* captures
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21 the extent to which employees invest physical, emotional, and cognitive energy into their work
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23 roles (Kahn, 1990, 1992). In this regard, engagement serves as a mechanism that assists in the
24
25 attainment of other valued outcomes, such as increased task performance and citizenship
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27 behavior (Rich, LePine, & Crawford, 2010). To date, research has primarily considered how
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29 intrusions may break or divert employee attention, thereby increasing job demands and making
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31 goal accomplishment more difficult (e.g., Couffe & Michael, 2017; Dodhia & Dismukes, 2009;
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33 Speier et al., 1999). For instance, scholars have shown that as employees experience demands
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35 that draw their focus away from work, performance may suffer (Speier et al., 1999). We extend
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37 this literature by arguing that although some intrusions likely act as job demands that hinder goal
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39 achievement—thereby decreasing engagement—other intrusions may act as job demands that
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41 provide opportunities for learning and growth—thereby increasing engagement. Our choice of
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43 engagement as a potential mechanism was motivated by previous research that has examined
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45 intrusions from an attentional perspective (e.g., Jett & George, 2003; Schneider & Fisk, 1982;
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47 Speier et al., 1999), suggesting that work engagement is likely to (1) be affected by intrusions
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49 and (2) have an impact on organizationally relevant outcomes.
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3 We first consider the impact of non-role intrusions (e.g., a coworker stopping by to ask
4 about an employee's weekend) on work engagement. Due to the nature of intrusions, employees
5 are forced to divert their attention from their immediate task. When mental connections to the
6 task at hand are disrupted, cognitive energy is directed toward the content of the intrusion either
7 temporarily or for an extended period of time (Baethge, Rigotti, & Roe, 2015; Chisholm,
8 Collison, Nelson, & Cordell, 2000; Gillie & Broadbent, 1989). Scholars have noted that these
9 types of cognitive transitions may lead to a reduction or elimination of cognitions directed
10 toward the initial task (Dodhia & Dismukes, 2009; Leroy, 2009; Methot, Rosado-Solomon,
11 Downes, & Gabriel, in press), thereby dividing attention (Kahneman, 1973). Even routine events
12 that disrupt employees' focus on tasks can require long periods of time before employees have
13 fully regained focus on the initial task (Goleman, 2013).

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15 Due to people's relative inability to attend to multiple things simultaneously (Boring,
16 1950; Kahneman, 1973), intrusions should require employees to shift their cognitions away from
17 the task. This may disrupt the employee's engagement with their work when the content of the
18 intrusion is different from the content of the task, as is the case—by definition—with non-role
19 intrusions. In order to appropriately listen to and respond to their colleague, employees need to
20 disengage from a task-focused mindset and transition to a more social-focused mindset. Given
21 the disparity between these two mindsets, the non-role intrusion should be a substantial
22 disruption to the employee's engagement in their work tasks. Our proposal is consistent with
23 prior research that suggests employees' can have difficulty shifting between cognitive domains
24 (Goschke, 2000; Meiran, 2000). Taken together, we propose that non-role intrusions will divert
25 employees' attention away from their tasks, thereby reducing work engagement.

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54 *Hypothesis 1:* Non-role intrusions are negatively related to work engagement.
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3 We next consider the impact of in-role intrusions (e.g., a coworker stopping by to check
4 on the status of a current project) on work engagement. By their very nature, in-role intrusions
5 are likely to introduce work-related time pressure and workload, thereby increasing cognitive
6 demands. Although these demands have the potential to be obstacles to task accomplishment,
7 prior research suggests that employees tend to be motivated by increased workload and time
8 pressure (Cavanaugh et al., 2000; LePine, Podsakoff, & LePine, 2005). Indeed, research
9 indicates that these demands regularly increase focused effort on work tasks (e.g., Baethge et al.,
10 2015; Mauno, Kinnunen, & Ruokolainen, 2007; Rodell & Judge, 2009). Although in-role
11 intrusions may disrupt employees' attention, the content of these work-related intrusions should
12 align closely enough with typical work experiences that a large mental reconfiguration is not
13 required. Consequently, the demands created from in-role intrusions should be more likely to
14 incite role-directed action.
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31 Thus, although in-role intrusions are likely to lead to increased time pressure and
32 workload (Jett & George, 2003), these job demands are often met with productive responses
33 aimed at meeting those demands, including increased engagement in the work at hand
34 (Crawford, LePine, & Rich, 2010). Increased engagement in work tasks is an active response that
35 should allow employees to manage the additional demands that accompany new assignments and
36 requests for status updates on existing assignments. Likewise, we suggest that in-role intrusions
37 will foster an increased focus and attention toward work (i.e., engagement). In line with our
38 assertions, between-person examinations suggest employees may cope with job demands by
39 increasing attention to their immediate tasks (Pieters & Warlop, 1999).
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51 *Hypothesis 2:* In-role intrusions are positively related to work engagement.

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54 Work engagement is an important consideration for organizations because it impacts key
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3 employee outcomes. One outcome of particular interest is *task-focused citizenship behavior*—
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5 employee behaviors that go beyond the normal scope of work responsibilities and help to resolve
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7 work- and organization-related issues (Settoon & Mossholder, 2002). Kahn (1990) argued that
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9 engaged employees are more fully connected to both their work and their organization. This
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11 connectedness may promote a broadened mindset in which employees consider additional
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13 avenues through which they might benefit the organization (Rich et al., 2010). Employees who
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15 invest their energies more fully in their work are more likely to see the value of extra-role
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17 behaviors that benefit the organization and are also more likely to step outside their required
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19 roles to engage in those behaviors (Christian, Garza, & Slaughter, 2011). Moreover, engaged
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21 employees should also have the necessary energy to participate in these behaviors (Matta, Scott,
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23 Koopman, & Conlon, 2015). The conceptualization of engagement as an employee's focus on
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25 "complete role performance" (Kahn, 1990, 1992) and empirical work that has examined overall
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27 engagement and citizenship behavior at the between-person level (e.g., Christian et al., 2011;
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29 Rich et al., 2010) suggest that engagement should have a positive impact on task-focused
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31 citizenship.
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38 Taken together, our model suggests intrusions will have indirect effects on task-focused
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40 citizenship through work engagement. As employees experience non-role intrusions, which
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42 involve small talk or personal conversation, attention is shifted away from work-related matters.
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44 These non-work intrusions should incur cognitive switching costs that hamper employees' ability
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46 to engage in their tasks and, consequently, their participation in task-focused citizenship
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48 behavior. Conversely, we predict that employees will have greater levels of work engagement
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50 following in-role intrusions. As employees increase attention and effort to address the demands
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52 of these in-role intrusions, they should experience an increase in engagement, thereby facilitating
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3 task-focused citizenship behavior.

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5 *Hypothesis 3a:* Non-role intrusions have a negative indirect effect on task-focused
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7 citizenship through work engagement.

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10 *Hypothesis 3b:* In-role intrusions have a positive indirect effect on task-focused
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12 citizenship through work engagement.

Intrusions, Collaboration, and Person-Focused Citizenship

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17 Jett and George's (2003) proposal that intrusions can be positive was largely based on the
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19 notion that intrusions provide opportunities to interact with other members of the organization,
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21 thereby increasing the flow of information. In contrast, isolated employees are cut off from
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23 potentially beneficial communication. Building on this proposal, we next consider the benefits
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25 that might stem from increased interactions with colleagues, which we operationalize as
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27 *collaboration*—the extent to which an employee works with colleagues on task assignments
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29 (Bedwell, Wildman, DiazGranados, Salazar, Kramer, & Salas, 2012; Harrison, Price, Gavin, &
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31 Florey, 2002; Rousseau, Aubé, & Savoie, 2006). Collaboration facilitates several important work
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33 behaviors (e.g., cooperation, coordination, and information exchange) that are likely to have an
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35 impact on valued work outcomes (Rousseau et al., 2006). Recognizing its importance, many
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37 organizations have instituted structural changes to increase collaboration, such as office designs
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39 that remove physical barriers to collaboration, and reducing or eliminating employees' ability to
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41 telecommute (Pentland, 2012; Swisher, 2013).

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47 We first consider the impact of non-role intrusions on collaboration. Collaboration often
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49 stems from unplanned encounters that transition into productive, work-related exchanges
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51 (Waber, Magnolfi, & Lindsay, 2014). For instance, a conversation that begins with a colleague
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53 stopping by to ask about the employee's weekend may organically transition into a conversation
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3 around a joint work project. Indeed, one of the key benefits of an intrusion is that it increases
4 access to another employee (Hunter, Clark, & Carlson, 2019), which then enhances
5 communication and collaboration (Okhuysen & Eisenhardt, 2002; Perlow, 1999). Accordingly,
6 we suggest that non-role intrusions may prime other work-related interactions that contribute to
7 increased collaboration. Further supporting this notion, scholars have suggested that small talk
8 plays a key role in work-related exchanges by facilitating transitions into and out of task-related
9 conversations (Holmes, 2000). Non-role intrusions may also act as a distinct and immediate cue
10 that a coworker is receptive to working jointly on a project (Isbister & Nass, 2000).

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22 *Hypothesis 4: Non-role intrusions are positively related to collaboration.*

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24 We next consider the impact of in-role intrusions on collaboration. In-role intrusions
25 initiate a dialogue surrounding a work task, which is a natural opportunity for employees to
26 discuss ideas and share information concerning other work (Rousseau et al., 2006). Indeed,
27 sharing task-related information and ideas has been identified as an integral part of collaborative
28 behavior (Janz, Colquitt, & Noe, 1997; Tjosvold & Tjosvold, 1995). The transition from an in-
29 role intrusion to work collaboration may manifest in several ways. For instance, conversations
30 around work tasks are likely to coincide with discussions aimed at outlining and synchronizing
31 work processes to avoid duplicating individual efforts (Cannon-Bowers, Tannenbaum, Salas, &
32 Volpe, 1995). To illustrate, consider an employee who is intruded upon by a coworker requesting
33 an update on a project. In the process of responding to that coworker, the employee has the
34 opportunity to solicit input from the coworker and the coworker has an opportunity to provide
35 information that may be helpful for completing the task (Jett & George, 2003). The intrusion
36 may also spark collaboration by providing the employee with an immediate opportunity to
37 discuss other joint tasks. Thus, although the in-role intrusion temporarily redirected the
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3 employee's attention, it also provided access to helpful information and an opportunity for
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5 collaboration. Addressing this notion, Jett and George (2003) proposed that intrusions provide
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7 opportunities for information sharing and feedback that are "unlikely to occur through more
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9 established means" (p. 497).

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12 *Hypothesis 5:* In-role intrusions are positively related to collaboration.

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15 Although collaboration itself can be a desirable outcome for organizations, it also has
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17 implications for downstream work outcomes. One aspect of employee performance that is
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19 especially relevant to collaboration is *person-focused citizenship behavior*—helping behavior
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21 directed toward colleagues that generally manifests as social support, counseling, or
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23 demonstrations of concern (Settoon & Mossholder, 2002). Collaboration provides opportunities
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25 to help others that are not present when employees are working in isolation. Supporting this
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27 proposal, recent empirical work has found that when employees work jointly, they are more
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29 likely to engage in helping behaviors (Liang, Shih, & Chiang, 2015). We predict that employees
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31 who collaborate with others at work will have both the opportunity and desire to engage in
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33 helping behaviors towards their colleagues, resulting in increased person-focused citizenship
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35 behavior.
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41 Taken together, our model predicts that intrusions will have indirect effects on person-
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43 focused citizenship behavior. Intrusions throughout the workday provide an opportunity for
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45 employees to collaborate with their colleagues. As collaboration increases, employees are more
46
47 willing and able to engage in person-focused citizenship behavior. In sum, we propose that non-
48
49 role and in-role intrusions will lead to increases in collaboration that increase person-focused
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51 citizenship behavior.
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53
54 *Hypothesis 6a:* Non-role intrusions have a positive indirect effect on person-focused
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citizenship behavior through collaboration.

Hypothesis 6b: In-role intrusions have a positive indirect effect on person-focused

citizenship behavior through collaboration.

STUDY 1: METHOD

Sample

We first examined the effects of non-role and in-role intrusions on both work engagement and collaboration with an experimental ESM utilizing a daily critical incident approach. Our sample for this study included 139 full-time employees who were employed in fields such as healthcare, sales, education, and finance. The sample consisted of professional MBA students from a large Southwestern university and up to one coworker of each participating MBA student. For the purposes of this study, the students and coworkers were equivalently treated as focal participants, hereafter referred to as “employees.” The MBA students received course credit for participation; coworker recruits received a \$20 online gift card. We utilized a hybrid snowball technique to recruit our sample. A total of 88 students were invited to participate; 75 registered to participate (85%). A total of 73 coworkers were invited to participate; 64 registered to participate (88%). The average age of all participants was 34 years old ($SD = 7.68$), average organizational tenure was 5 years ($SD = 5.13$), and 40% of employees were female.

Procedure

One week prior to the launch of the daily surveys, employees were invited to register for the study and to provide demographic information. They were instructed that they would be completing a daily survey around mid-day for 12 consecutive work days. Each day, participants were randomly and evenly assigned to either the non-role, in-role, or control condition. This “constrained” randomization assures that each participant is assigned to each condition on 4

WORKPLACE INTRUSIONS

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3 days, with a random pattern (e.g., Woolum, Foulk, Lanaj, & Erez, 2017). In all conditions on all
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5 days, the survey focused the employees on their experiences “today.” On days when assigned to
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7 the non-role condition, employees were asked to recall and summarize their most recent non-role
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9 intrusion, described as the “most recent instance when you were working on a task and
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11 somebody stopped by to discuss a non-work-related topic (e.g., have a personal conversation,
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13 make small talk, etc.).” When assigned to the in-role condition, employees were asked to recall
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15 and summarize their most recent in-role intrusion, described as the “most recent instance when
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17 you were working on a task and somebody stopped by to discuss a work-related topic (e.g.,
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19 assign new work, ask for a status update, discuss a current project, etc.).” When assigned to the
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21 control condition, employees were asked to “describe your experiences at work today.”
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26 Employees next rated their work engagement and collaboration. When assigned to an
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28 intrusion condition, employees were asked to rate their engagement and collaboration following
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30 the intrusion they identified and summarized. When assigned to the control condition,
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32 participants were asked to think about their general experiences that day when rating engagement
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34 and collaboration. Days on which participants were assigned to an intrusion condition but were
35
36 not able to identify having experienced that type of intrusion were excluded from our
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38 observations. This resulted in 906 days of data across 139 full-time employees—an average of
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40 6.52 days per employee and a 54.3% response rate.
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44 To unpack the potential effects of missing data, we engaged in a supplemental analysis to
45
46 test whether we could support a “missing at random” assumption in Study 1. We followed
47
48 previous work (e.g., Little & Rubin, 1989; Newman, 2014; Schafer & Graham, 2002) that has
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50 outlined statistical ways to test for the presence of patterns. These best practices suggest that
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52 when there is a variable (e.g., X) with missing data, a dummy variable—*miss(X)*—should be
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WORKPLACE INTRUSIONS

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3 created and coded as 0 when observed and 1 when missing. If $miss(X)$ is not related to X , this
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5 supports a “missing at random” classification. Accordingly, we investigated the extent to which
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7 missing values on our measured variables of engagement— $miss(M1)$ —and collaboration—
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9 $miss(M2)$ —were related to engagement and collaboration. We observed that $miss(M1)$ was not
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11 related to engagement ($r = -.02, p = .37$) and $miss(M2)$ was not related to collaboration ($r = -.02,$
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13 $p = .57$), thereby supporting a “missing at random” classification (Newman, 2014).
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Measures

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19 *Work Engagement.* Employees reported their level of work engagement using all 9 items
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21 from Crawford, LePine, & Buckman (2013), which they adapted from Rich et al. (2010). To
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23 reflect the daily nature of our surveys, we adapted the items to reference employees’ “tasks” as
24
25 opposed to their “job.” Sample items included “Today, I concentrated completely on my tasks,”
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27 “Today, I put my feelings into my tasks,” and “Today, I devoted a lot of energy to my tasks.”
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30 Scholars have noted potential benefits of reliability calculations that account for nested designs
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32 (e.g., Geldhof, Preacher, & Zyphur, 2014; Nezlek, 2017). As such, we supplemented our
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34 reporting of Cronbach’s alpha with Geldhof et al.’s (2014) multilevel alpha (Cronbach’s $\alpha = .93$;
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36 multilevel $\alpha = .92$).
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41 *Collaboration.* Employees rated their collaboration using a three-item scale adapted from
42
43 Kahn and Mentzer (1998) to function at the daily level. Items were, “Today, my workgroup has
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45 collaborated on work assignments,” “Today, we have worked jointly as a workgroup on work
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47 tasks,” and “Today, my workgroup has worked closely on projects together” (Cronbach’s $\alpha =$
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49 $.96$; multilevel $\alpha = .95$).
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STUDY 1: RESULTS

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54 We used multilevel path analysis within Mplus 8 (Muthén & Muthén, 2010) to test our
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WORKPLACE INTRUSIONS

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3 hypotheses. Exogenous variables were specified at the within-person level (Level 1) using
4 random slopes for the hypothesized pathways (e.g., Ilies, Liu, Liu, & Zheng, 2017; Koopman,
5 Lanaj, & Scott, 2016). To test the effects of non-role intrusions on both work engagement and
6 collaboration, we utilized a within-person comparison of the non-role intrusion condition versus
7 the control condition. Similarly, to test the effects of in-role intrusions on both engagement and
8 collaboration, we utilized a within-person comparison of the in-role condition versus the control
9 condition.³

Hypotheses Tests

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21 Descriptive statistics for all study variables are reported in Table 1. In support of
22 Hypothesis 1, non-role intrusions decreased work engagement ($\gamma = -.13, p = .032, SE = .06$). We
23 also found that in-role intrusions increased work engagement ($\gamma = .10, p = .034, SE = .05$),
24 supporting Hypothesis 2. The relationship between non-role intrusions and collaboration was not
25 significant ($\gamma = -.07, p = .418, SE = .08$). Thus, Hypothesis 4 was not supported. In support of
26 Hypothesis 5, in-role intrusions increased collaboration ($\gamma = .12, p = .044, SE = .06$).
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38 Insert Table 1 about here
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STUDY 1: DISCUSSION

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43 The results of Study 1 provide initial support for our hypothesized model. Experiencing
44 an in-role intrusion increased both work engagement and collaboration, while experiencing a
45 non-role intrusion decreased work engagement. However, we did not find a significant
46 relationship between experiencing a non-role intrusion and collaboration. Our use of random
47 assignment of condition within-person allowed us to account for the role of between-person
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factors via design, and our sample of full-time employees across various industries provided evidence that our findings are not restricted to specific contexts. Moreover, our use of a daily critical incident approach to capture intrusions provided a more proximal link between intrusions and both engagement and collaboration. That said, one limitation of this study design is that there is no way to know whether data is missing in a way that has a meaningful impact on the results (Fisher & To, 2012; Stone & Broderick, 2009). In Study 2, we expand upon our findings and provide additional evidence for the first stage of our causal model by capturing the unique role of non-role and in-role intrusions on engagement and collaboration via an experiment.

STUDY 2: METHOD

Sample

In Study 2, we examined the effects of non-role and in-role intrusions on both work engagement and collaboration with an experiment using 201 participants recruited through Prolific. All participants were employed full-time and resided in the United States. Participants earned a flat fee of \$3. The average age of all participants was 34 years old ($SD = 10.71$), average full-time work experience was 13 years ($SD = 9.66$), and 70% of participants were female. There was no missing data in this study.

Procedure

In this study, we conducted a between-subjects online experiment with random assignment to condition (non-role intrusions, in-role intrusions, or control). During the recruitment process, workers were told that they would be helping to validate transcription software designed for use in future research, and thus would be asked to review and provide corrections for several transcriptions. We used this specific task design as it mirrors one type of task that crowd workers often complete (Evanini, Higgins, & Zechner, 2010; Marge, Banerjee, &

WORKPLACE INTRUSIONS

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3 Rudnicky, 2010; Schmidt, 2015), and thus provides for a more typical task experience and a
4 reasonable cover for the underlying experiment. To manipulate intrusions, participants were told
5 that they would be paired with another individual who would be completing the same
6 transcriptions at the same time, as that would provide the research team with additional
7 confidence in the proposed corrections. Unbeknownst to participants, this person was an
8 electronic confederate. We utilized an electronic confederate for our manipulations as that
9 provided all participants with a consistent experience and allowed us to reduce systematic and
10 random error variance that is often associated with human confederates (Leavitt, Qiu, & Shapiro,
11 2021).
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24 All participants were assigned four short transcriptions to review and correct. In the in-
25 role condition, participants were intruded upon by the confederate at three different times over
26 the course of completing the transcriptions with an in-role intrusion, such as “What types of
27 errors are you finding?” Participants in the non-role condition were intruded upon three times
28 with a non-role intrusion, such as “What did you have for dinner last night?” In both conditions,
29 these intrusions occurred after completing the first, second, and fourth transcription. After each
30 intrusion, participants were given the opportunity to respond to the confederate. If participants
31 chose to respond, the confederate provided an additional follow-up message to the participant’s
32 response. In addition, participants were also given the opportunity to send an unsolicited
33 message to the confederate while completing the tasks. In the control condition, participants did
34 not receive any intrusions. However, to mirror the intrusions conditions, they did have the
35 opportunity to send a message to the confederate. After completing the tasks, participants were
36 asked to rate their level of engagement on the tasks and their collaboration with their partner.
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54 The average time for completing the entire study across the various conditions was: non-role
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intrusions = 23.77 minutes ($SD = 8.07$); in-role intrusions = 24.04 minutes ($SD = 7.45$); control = 22.76 minutes ($SD = 9.58$).

Measures

Work Engagement. Participants reported their level of work engagement using the same items from Study 1 ($\alpha = .85$).

Collaboration. Participants rated their level of collaboration using the same items from Study 1 ($\alpha = .90$).

STUDY 2: RESULTS

We used between-subjects ANOVAs within SPSS to test our hypotheses. To test the effects of non-role intrusions on both work engagement and collaboration, we compared participant responses in the non-role intrusion condition versus the control condition. Similarly, to test the effects of in-role intrusions on both work engagement and collaboration, we compared participant responses in the in-role intrusion condition versus the control condition.

Insert Table 2 about here

Hypotheses Tests

Descriptive statistics for all study variables are reported in Table 2. In support of Hypothesis 1, participants in the non-role intrusion condition ($M = 5.08$, $SD = 0.72$) reported lower work engagement than participants in the control condition ($M = 5.36$, $SD = 0.72$, $F[1, 137] = 5.05$, $p = .026$). Participants in the in-role intrusion condition ($M = 5.68$, $SD = 0.75$) reported higher work engagement than participants in the control condition ($M = 5.36$, $SD = 0.72$, $F[1, 130] = 6.44$, $p = .012$), supporting Hypothesis 2. We did not observe a significant

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3 difference in collaboration reported between participants in the non-role condition ($M = 1.56$, SD
4 $= 1.00$) and the control condition ($M = 1.66$, $SD = 1.00$, $F[1, 137] = 0.39$, $p = .534$). Thus,
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6
7 Hypothesis 4 was not supported. In support of Hypothesis 5, participants in the in-role condition
8
9 ($M = 2.77$, $SD = 1.47$) reported higher collaboration than participants in the control condition (M
10 $= 1.66$, $SD = 1.00$, $F[1, 130] = 26.23$, $p < .001$).
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STUDY 2: DISCUSSION

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17 In Study 2, we replicated our findings in Study 1 using random assignment and an
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19 experimental manipulation to rule out alternative explanations and provide evidence of causality.
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21 Consistent with our previous study, we found that in-role intrusions increased both work
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23 engagement and collaboration, non-role intrusions decreased work engagement, and there was
24
25 not a significant relationship between non-role intrusions and collaboration. That said, Study 2
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27 did not allow us to test our full theoretical model. Examining intrusions in their natural setting
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29 (e.g., employees in a work environment) also has the added benefit of providing additional
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31 evidence of external validity. As such, we assessed our full theoretical model with an ESM
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33 investigation of research scientists in Study 3.
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STUDY 3: METHOD**Item Development**

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42 Given that previous research has not distinctly operationalized multiple types of
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44 intrusions, it was first necessary to develop measures of workplace intrusions. We started by
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46 following Hinkin and Tracey's (1999) content validation procedure, which quantitatively
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48 assesses the extent to which items reflect a conceptual definition (MacKenzie, Podsakoff, &
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50 Podsakoff, 2011). First, we created items for each of the two types of intrusions that reflected our
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52 conceptual definitions. We then asked 201 participants, recruited via Amazon's MTurk, to rate
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3 the extent to which the items matched the conceptual definitions. The items for non-role
4 intrusions were prefaced with “Today, while focused on a work-related task, people at work...,”
5 and included “Stopped by to socialize,” “Reached out to chat about non-work things,” and
6
7 “Engaged me in small talk.” The items for in-role intrusions were prefaced with “Today, while
8 focused on a work-related task, people at work...,” and included “Requested that I take on a new
9 work task,” “Reached out to include me in a new project,” “Asked me about the status of a task I
10 was assigned,” and “Inquired about how I am progressing on one of my tasks.” The average age
11 of participants was 40 years old ($SD = 12.18$) and 42% of participants were female. Average
12 work experience was 18 years ($SD = 11.58$). Participants earned a flat fee of \$1 for their
13 participation. Missing data was handled using listwise deletion.
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26 Each participant was randomly assigned to one of two conditions. In each condition, the
27 definition for one type of intrusions was presented, along with the items for both types of
28 intrusions. Participants then rated the correspondence between the items and the conceptual
29 definition using a seven-point scale (1 = *Item is an extremely bad match to the definition* to 7 =
30 *Item is an extremely good match to the definition*). For example, participants in the non-role
31 intrusions condition were asked to rate the correspondence of the non-role and in-role items to
32 the non-role intrusions definition. We then tested whether the items for a given type of intrusion
33 had (1) appropriately high mean levels of correspondence to their own definition and (2) higher
34 mean levels of correspondence than the items for the other intrusion construct.
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47 The mean level of definitional correspondence between the non-role intrusions items and
48 their definition was 6.36 out of 7. The mean level of definitional correspondence between the in-
49 role items and their definition was 6.33 out of 7. These levels compare favorably to other uses of
50 this technique (e.g., Colquitt, Baer, Long, & Halvorsen-Ganepola, 2014; Gardner, 2005; Hinkin
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3 & Tracey, 1999; Rodell, 2013), and meet the benchmark of “very strong” correspondence
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5 (Colquitt, Sabey, Rodell, & Hill, 2019). We then used a repeated-measures ANOVA to test
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7 whether the items for a given definition had a higher definitional correspondence to their
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9 definition than did the other items (Hinkin & Tracey, 1999). This analysis shows, for example,
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11 whether the non-role intrusions items—when compared to the in-role items—had a significantly
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13 higher correspondence to the non-role intrusions definition. Results showed that the non-role
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15 intrusions items had significantly higher levels of correspondence to the definition of non-role
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17 intrusions than did the in-role intrusions items ($\text{Mean}_{\text{diff}} = 4.41, p < .05$). The in-role intrusions
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19 items also had significantly higher levels of correspondence to the definition of in-role intrusions
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21 than did the non-role intrusions items ($\text{Mean}_{\text{diff}} = 3.88, p < .05$).
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26 Our use of Hinkin and Tracey’s (1999) procedure provided initial evidence that our
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28 intrusions measures are content valid and empirically distinct. As a subsequent step, scholars
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30 have recommended that a confirmatory factor analysis be conducted on measures that have been
31
32 content validated (MacKenzie et al., 2011). Therefore, we supplemented our initial results with a
33
34 confirmatory factor analysis of the two intrusions measures. Utilizing MTurk, we recruited a new
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36 sample of 126 participants to quantitatively rate the extent to which they experienced each type
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38 of intrusion in their current workday. The average age of participants was 32 years ($SD = 8.60$);
39
40 33% of participants were female. Their average work experience was 11 years ($SD = 8.44$).
41
42 Criteria for eligibility was that participants were employed full-time and attended work on the
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44 day they completed the survey. These criteria helped to ensure that participants recently had the
45
46 opportunity to be intruded upon. Participants earned a flat fee of \$1 for their participation.
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48 Missing data was handled using listwise deletion. Our hypothesized two-factor structure of
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50 intrusions exhibited acceptable fit to the data: $\chi^2(20) = 58.76, p < .05$; comparative fit index
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(CFI) = .95; Tucker-Lewis index (TLI) = .93; standardized root mean square residual (SRMR) = .08. This two-factor structure fit the data better than an alternative model that included all of the intrusion items as indicators of one omnibus intrusion factor: $\chi^2(21) = 312.01, p < .05$; CFI = .61; TLI = .48; SRMR = .19; $\Delta \chi^2(1) = 253.25, p < .001$. In sum, our analyses provide evidence that our measures of the two types of intrusions are content valid and empirically distinct.

Sample

Using the measures of intrusions that we developed and validated, we proceeded to test our hypothesized model via ESM. Our sample consisted of 70 employee–coworker dyads who were all scientists in an organization specializing in metallurgy development, manufacturing, and testing. The average age of employees was 47 years old ($SD = 7.95$) and 85% of employees were male. Average tenure at the company was 17 years ($SD = 8.26$). The average age of coworkers was 39 years old ($SD = 10.49$) and 83% of coworkers were male. Average tenure at the company was 12 years ($SD = 9.24$). Employees and coworkers were not provided any compensation for participating in the study.

Procedure

We examined our full theoretical model using ESM for several reasons. First, a within-person approach is consistent with our theorizing surrounding intrusions, which are unpredictable by nature and vary on a day-to-day basis (Jett & George, 2003; Kirmeyer, 1988). Second, given the potential for the frequency and type of intrusion to vary on a daily basis, a within-person approach allowed us to capture these dynamics in a way that accurately reflects a representative sampling of employees' immediate workplace experiences (Beal, 2015; Liu, Zhan, & Wang, 2011; Weiss & Rupp, 2011). Finally, a daily, within-person research design is also consistent with other research examining perceptions and behaviors that vary on a daily basis

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(e.g., Courtright, Gardner, Smith, McCormick, & Colbert, 2016; Koopman et al., 2016; Scott, Matta, & Koopman, 2016).

We took several steps to align with current ESM “best practices.” First, we employed both time and source separation, as research indicates that time and source separation are two of the most effective approaches for limiting common method bias (Doty & Glick, 1998; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In addition, we controlled for previous-day levels of work engagement, collaboration, task-focused citizenship, and person-focused citizenship. Controlling for previous-day levels of mediators and dependent variables in ESMs allows for the interpretation of results as the change in the level of these variables from prior assessments (e.g., Baer, Matta, Kim, Welsh, & Garud, 2018; Johnson, Lanaj, & Barnes, 2014; Scott & Barnes, 2011), thereby providing some evidence for the causal directionality of our model (Beal, 2015).

The company initially provided us with 99 employee–coworker dyads. All dyads were randomly paired by the company following our instruction that members of each dyad needed to be part of the same work group. This instruction was given to ensure that dyads had sufficient interaction to provide variance in our constructs of interest during the course of the study. We used random pairing in order to limit the possibility that selection biases would influence our results. We requested participation from the employees and coworkers via an on-site meeting that briefed them on the design of the study. Potential participants were then emailed a registration survey that assessed demographic information.

Employees and coworkers who opted-in to the study completed daily surveys over the course of three full work weeks (i.e., 15 consecutive work days; Monday–Friday). Each day, employees received a survey at 12 p.m. which asked them to report the extent to which they had

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3 experienced both types of intrusions so far that day. We chose 12 p.m. as the initial survey time
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5 to grant employees enough time following the start of their work day to experience intrusions.
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7 Near the end of each workday—4 p.m.—employees received a follow-up survey that asked them
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9 to report on their daily level of work engagement and collaboration with coworkers. Each day at
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11 4 p.m., we also sent a survey to each employee’s coworker. This survey requested an assessment
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13 of the focal employee’s daily task- and person-focused citizenship behavior. Administering this
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15 survey at 4 p.m. provided a window of time to capture changes in employee behaviors following
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17 the intrusions they experienced earlier that day.
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22 In total, 81 employee–coworker dyads had at least one complete day of surveys. Across
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24 all time periods, we received a total of 2,207 completed daily surveys (763 at Employee T1, 693
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26 at Employee T2, and 751 for the Coworker survey) out of a possible 3,150 daily surveys, for an
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28 overall survey completion rate of 70.1%. We used full information maximum likelihood (FIML)
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30 to handle missing data, and we used random slopes for hypothesized pathways (e.g., Ilies et al.,
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32 2017; Koopman et al., 2016). Given that Mplus requires that there are no missing values for
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34 predictor variables when using random slopes with FIML (Grund, Lüdtke, & Robitzsch, 2018),
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36 we excluded observations that had missing values on any predictor variables (i.e., the
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38 independent variables [intrusions] and the mediator variables [work engagement and
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40 collaboration]). We did not pre-exclude observations that only had missing values on dependent
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42 variables. Best-practices for experience sampling studies recommend only including cases with
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44 at least three days of complete data (e.g., Singer & Willett, 2003; Trougakos, Hideg, Cheng, &
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46 Beal, 2014). After following this direction, we had a final sample of 70 employee–coworker
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48 dyads, comprising 671 days of data—an average of 9.59 days per dyad. This number represents a
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50 final response rate of 63.9%.
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We engaged in a supplemental analysis of our missing data to test whether we could support a “missing at random” assumption in Study 3, as per the procedure outline in Study 1. After creating dummy variables to capture “missingness” for all of our focal variables (Little & Rubin, 1989; Newman, 2014; Schafer & Graham, 2002), we observed no significant relationships between our study variables and missingness on those individual variables (non-role intrusions: $r = -.05, p = .13$; in-role intrusions: $r = .01, p = .71$; work engagement: $r = .01, p = .73$; collaboration: $r = .03, p = .44$; task-focused citizenship: $r = .02, p = .60$; person-focused citizenship: $r = .04, p = .24$). As such, a “missing at random” classification was supported for all focal variables in our model (Newman, 2014).

We also ran a test of our mediation model in which the random slopes for the stages of the indirect effects were allowed to covary. However, none of the covariances were significant, and all were near zero (range = $-.01$ to $.01$). As such, we followed best-practice recommendations to retain the simpler mediation model without these covariances included (Tofighi, West, & MacKinnon, 2013).

Measures ⁴

Intrusions. Using our validated measures, the scientists in our sample were asked to rate the extent to which their colleagues had engaged in the listed behaviors that morning. The items for both non-role (Cronbach’s $\alpha = .89$; multilevel $\alpha = .86$) and in-role (Cronbach’s $\alpha = .85$; multilevel $\alpha = .84$) intrusions were prefaced with “Today, while focused on a work-related task, people at work...”. All items were measured on a 6-point Likert scale ranging from 1 = *not at all* to 6 = *a great deal*.

Work Engagement. The employees reported their level of work engagement using six items from the nine-item measure of engagement from Crawford et al. (2013). We used 2 items

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3 from each facet of engagement (cognitive, emotional, and physical). Sample items included
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5 “Today, I concentrated completely on my job,” “Today, I put my feelings into my job,” and
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7 “Today, I devoted a lot of energy to my job” (Cronbach’s $\alpha = .87$; multilevel $\alpha = .75$). The items
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9 were measured on a 6-point Likert scale ranging from 1 = *not at all* to 6 = *a great deal*.

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12 **Collaboration.** Employees rated their level of collaboration using the same items from
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14 Study 1 and Study 2 (Cronbach’s $\alpha = .92$; multilevel $\alpha = .85$). Items were measured on a 6-point
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16 Likert scale from 1 = *strongly disagree* to 6 = *strongly agree*.

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19 **Task-focused citizenship.** Task-focused citizenship was assessed by coworkers using
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21 three items adapted from Settoon and Mossholder (2002) for use in an ESM format. All items
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23 asked the coworkers to report on employee behavior “today.” Items were, “Today, [employee
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25 name] took on extra responsibilities to help coworkers when things got demanding at work,”
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27 “Today, [employee name] helped coworkers with difficult assignments, even when assistance
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29 was not directly requested,” and “Today, [employee name] assisted coworkers with heavy work
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31 loads even though it was not part of the job” (Cronbach’s $\alpha = .94$; multilevel $\alpha = .86$). Items were
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33 measured on a 6-point Likert scale from 1 = *not at all* to 6 = *a great deal*.

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37 **Person-focused citizenship.** Person-focused citizenship was assessed by coworkers using
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39 three items adapted from Settoon and Mossholder (2002) for use in an ESM format. All items
40
41 asked the coworkers to report on employee behavior “today.” Items were, “Today, [employee
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43 name] showed concern and courtesy toward coworkers,” “Today, [employee name] went out of
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45 his/her way to be nice to others,” and “Today, [employee name] took time to listen to coworkers’
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47 problems and worries” (Cronbach’s $\alpha = .89$; multilevel $\alpha = .84$). The items were measured on a 6-
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49 point Likert scale ranging from 1 = *not at all* to 6 = *a great deal*.

Confirmatory Factor Analysis

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We conducted a multilevel confirmatory factor analysis to test overall model fit and to provide support for the distinctiveness of our constructs. We modeled non-role intrusions, in-role intrusions, collaboration, person-focused citizenship, and task-focused citizenship at the within-person level using item-level indicators of latent variables. Consistent with its operationalization (Rich et al., 2010), work engagement was modeled at the within-person level by specifying three first-order latent variables (emotional engagement, cognitive engagement, and physical engagement) as indicators of a second-order daily engagement factor. Our hypothesized model exhibited good fit to the data: $\chi^2(191) = 681.12, p < .05$; CFI = .93; TLI = .92; SRMR (within) = .05. Our proposed model fit the data better than an alternative model that specified all of the intrusion items as indicators of one omnibus intrusion factor: $\chi^2(196) = 1465.79, p < .05$; CFI = .82; TLI = .79; SRMR (within) = .10.

Insert Table 3 about here

STUDY 3: RESULTS

Given that ESM data is multilevel in nature (i.e., days nested within individuals), we used multilevel path analysis within Mplus 8 (Muthén & Muthén, 2010) to test our hypotheses. All daily variables were specified at the within-person level (Level 1) using random slopes for the hypothesized pathways (for similar see Ilies et al., 2017; Koopman et al., 2016; Wang, Liu, Liao, Gong, Kammeyer-Mueller, & Shi, 2013). Consistent with recommendations in the literature (e.g., Hofmann & Gavin, 1998; Ohly, Sonnentag, Niessen, & Zapf, 2010), we person-mean centered our exogenous variables. One key benefit of person-mean centering is that it removes all between-person variance from the level-1 predictors (Enders & Tofighi, 2007), effectively

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2
3 eliminating between-person confounds (e.g., personality) and several potential sources of same-
4 source bias (e.g., social desirability, acquiescence, and common rater effects; Matta, Scott,
5 Colquitt, Koopman, & Passantino, 2017; Podsakoff et al., 2003). The direct effects of non-role
6 and in-role intrusions on person- and task-focused citizenship were also modeled, in order to
7 conduct unbiased tests of the indirect effects (MacKinnon, Lockwood, Hoffman, West, & Sheets,
8 2002). In Table 3, we report the amount of variance in each construct at the within- versus the
9 between-person level. The use of multilevel analysis was supported, given that within-person
10 variance accounted for 34 to 63 percent of the variability in each of our constructs.

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21 Our indirect effect hypotheses were tested using a parametric bootstrap, as recommended
22 by Preacher, Zyphur, & Zhang (2010). We utilized a Monte Carlo bootstrap with 20,000
23 simulations to construct bias-corrected confidence intervals (Preacher & Selig, 2012). Following
24 recent multilevel research (e.g., Koopman et al., 2016; Lanaj, Johnson, & Barnes, 2014; Wang et
25 al., 2013), we used a 95 percent bias-corrected confidence interval.⁵

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Insert Figure 2 about here

Insert Table 4 about here

Hypotheses Tests

Descriptive statistics for all study variables are reported in Table 4. Multilevel path analysis results are provided in Figure 2. Hypothesis 1 predicted that non-role intrusions are negatively related to daily work engagement, whereas Hypothesis 2 predicted a positive

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1
2
3 relationship between in-role intrusions and work engagement. As shown in Figure 2, the
4
5 relationship between non-role intrusions and work engagement was negative and significant ($\gamma =$
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7 $-.07, p = .045, SE = .037$). Therefore, Hypothesis 1 was supported. In support of Hypothesis 2,
8
9 in-role intrusions were positively related to work engagement ($\gamma = .14, p = .008, SE = .055$).
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11 Hypothesis 3 predicted indirect effects of each type of intrusion on task-focused citizenship
12
13 through work engagement. As shown in Table 5, the confidence interval for the indirect effect of
14
15 non-role intrusions on task-focused citizenship through work engagement excluded zero ($-.01;$
16
17 $95\% \text{ CI } [-.036, -.001]$). Thus, Hypothesis 3a was supported. In support of Hypothesis 3b, the
18
19 indirect effect of in-role intrusions on task-focused citizenship through work engagement was
20
21 also significant ($.03; 95\% \text{ CI } [.006, .063]$).
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26 Hypotheses 4 and 5 predicted that non-role and in-role intrusions are positively related to
27
28 daily collaboration. As shown in Figure 2, the relationship between non-role intrusions and
29
30 collaboration was not significant ($\gamma = -.06, p = .374, SE = .062$). Thus, Hypothesis 4 was not
31
32 supported. In support of Hypothesis 5, in-role intrusions ($\gamma = .11, p = .012, SE = .045$) had a
33
34 significant positive relationship with collaboration. Hypothesis 6 predicted that the two types of
35
36 intrusions would have indirect effects on person-focused citizenship through collaboration. As
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38 shown in Table 5, the confidence interval for the indirect effect of non-role intrusions on person-
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40 focused citizenship through collaboration included zero ($-.01; 95\% \text{ CI } [-.032, .007]$). Thus,
41
42 Hypothesis 6a was not supported. The positive indirect effect of in-role intrusions on person-
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44 focused citizenship through collaboration was significant, supporting Hypothesis 6b ($.02; 95\%$
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46 $\text{CI } [.002, .043]$).^{6 & 7}
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54 Insert Table 5 about here
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STUDY 3: DISCUSSION

The results of Study 3 provide additional support for our model of workplace intrusions. In-role intrusions were positively related to both work engagement and collaboration, while non-role intrusions were negatively related to engagement. The receipt of both in-role and non-role intrusions also indirectly impacted the likelihood that employees would engage in citizenship behaviors on a given day. The results of Study 3 build upon our content validation efforts and provide additional evidence that workers differentiate between non-role and in-role intrusions. In addition, Study 3 provided us with evidence that there are meaningful differences in how employees respond to non-role and in-role intrusions via collaboration, work engagement, and citizenship behaviors. Importantly, we found converging results between our ESM study (multi-wave; time and source separated survey design; unique sample of research scientists) our within-person critical incident study, and our experiment, thereby providing additional confidence in our theoretical model.

GENERAL DISCUSSION

Intrusions are a ubiquitous and challenging aspect of organizational life. Although the literature has, understandably, often focused on the negative consequences of intrusions, our results suggest this perspective is incomplete. Consistent with prior theorizing (e.g., Jett & George, 2003), we found that non-role intrusions had a negative indirect effect on task-focused citizenship through work engagement. Yet, our study also revealed that some intrusions can lead to beneficial outcomes for employees. Specifically, we found that in-role intrusions increased collaboration, which then facilitated person-focused citizenship. We also found that in-role intrusions increased engagement and, subsequently, task-focused citizenship. Taken together, our

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3 findings paint a more nuanced picture of intrusions, suggesting that intrusions can be both
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5 beneficial and burdensome to employees.
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8 Our study advances theory on intrusions by considering two distinct types of intrusions
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10 that employees are likely to encounter. Previous empirical work has not clearly differentiated
11
12 various types of intrusions, leaving organizations with an incomplete picture of their dynamics.
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14 Extending previous research, we developed a more comprehensive model of the multifaceted
15
16 nature of intrusions by defining and differentiating non-role and in-role intrusions. Our
17
18 multifaceted approach allowed us to test and extend Jett and George's (2003) proposal that
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20 intrusions can both benefit and burden employees. Puranik et al. (2020) observed that empirical
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22 investigations of interruptions may focus on specific "episodes" or on the "aggregate effect" of
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24 interruptions over a period of time. Across 3 studies we found consistent support for our
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26 proposed relationships using both an episodic (Study 1, Study 3) and aggregate approach (Study
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28 2), providing additional evidence of the validity of our findings.
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33 Furthermore, our within-person methodological approach to these dynamics in Study 1
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35 and Study 3 provided insights that extant between-person investigations would not predict.
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37 Although intrusions are, by definition, "unexpected" and likely to vary on a daily basis (Jett &
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39 George, 2003; Kirmeyer, 1988), research has tended to take a between-person approach that
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41 potentially masks important dynamics. Whereas between-person empirical work on the impact of
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43 intrusions has assumed that being intruded upon will uniformly harm work outcomes, our daily-
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45 level investigations demonstrated that intrusions can also lead to beneficial work outcomes. Our
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47 results from Study 1 provide evidence that a specific non-role or in-role intrusion can create
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49 deviations in employee work engagement and collaboration. In addition, our results from Study 3
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51 show that intrusions vary daily and that such variations influence both person- and task-focused
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3 citizenship behavior at the daily level. Thus, our methodology allowed for theoretical insights
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5 that were not apparent with prior methodological approaches.
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7 8 **Practical Implications** 9

10 Our results also have practical implications for organizations. Perhaps most importantly,
11 our studies reveal that intrusions can lead to employee attitudes and behaviors that organizations
12 routinely try to maximize. Previous research has largely encouraged organizations to limit
13 intrusions as much as possible (for a review see Jett & George, 2003). In contrast, we
14 demonstrated that certain intrusions facilitate collaboration and increase work engagement.
15 Rather than attempting to eliminate all intrusions, we suggest that organizations may benefit
16 from allowing the types of intrusions that are most likely to promote beneficial outcomes. For
17 example, it may not be helpful for employees to frequently intrude on one another with small
18 talk. However, intrusions that convey important task-related information or facilitate
19 collaboration can be beneficial.
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33 Some organizations have recognized the value of unexpected employee interactions at
34 work, leading them to implement open-door policies, reduce telecommuting, and design open-
35 concept work spaces (Pentland, 2012; Swisher, 2013). Such changes may provide greater
36 opportunities for intrusions that promote engagement and collaboration. By understanding the
37 benefits associated with in-role intrusions, managers can work to model and encourage intrusions
38 that benefit employees. Similarly, managers could establish norms regarding work-related
39 intrusions. For example, a manager might communicate to employees that their door is always
40 open for discussing new projects and ideas, but conversations about sports and pop culture are
41 best saved for break time. Establishing norms around workplace intrusions might also help
42 ensure that the benefits of intrusions are not undermined because they occur either too rarely or
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WORKPLACE INTRUSIONS

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3 too frequently during the workday.
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5 The COVID-19 pandemic has made these issues particularly salient. At many
6 organizations, the majority of employees have been forced to work from home (Kelly, 2020).
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8 Some organizations, such as Twitter and Zillow, have indicated that they intend to allow
9 employees to work from home even after the pandemic has been resolved. There are
10 undoubtedly benefits of this new work arrangement, such as eliminating commutes and
11 providing employees with flexibility. It is likely that this new arrangement will also reduce
12 intrusions, at least those from colleagues. Our results suggest that employees—and their
13 organizations—may be missing out on the benefits that can arise from certain work-related
14 intrusions. As organizations re-tool their work-from-home policies, we advise them to factor
15 these dynamics into their decision making.
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Limitations and Suggestions for Future Research

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30 Our within-person approach in Study 1 and Study 3 allowed us to account for the unique
31 effects of non-role and in-role intrusions while controlling for potential between-person
32 confounds. That said, there are likely boundary conditions that provide insights into how
33 employees respond to different types of intrusions. For instance, the extent to which intrusions
34 are commonplace in a work environment may guide interpretations of the disruptiveness of non-
35 role intrusions. In addition, characteristics of the employee—such as conscientiousness,
36 achievement motivation, or aggressiveness—may also play an important role in how they
37 respond to specific intrusions. For instance, employees high in achievement motivation may
38 experience an even greater reduction in work engagement following a non-role intrusion.
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40 Moreover, existing relationship quality between employees also appears relevant, as intrusions
41 may lead to higher levels of engagement and collaboration when the intruding party is someone
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3 the employee considers a friend. Conversely, the positive effects we hypothesize may be
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5 attenuated (and the negative effects exacerbated) when the intruded upon employee dislikes the
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7 intruder. Finally, it is possible that the time duration of intrusions may shape employee responses
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9 in a variety of ways. For example, a series of intrusions from various coworkers that combine to
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11 occupy 60 minutes of an employee's time may have distinctly different outcomes than a single
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13 60-minute intrusion. One long in-role intrusion might be preferable for increasing collaboration,
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15 as it provides opportunity for more in-depth interaction. However, multiple short in-role
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17 intrusions may have more of an impact on engagement than one long in-role intrusion. Future
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19 research is needed to fully unpack the various factors that may guide how employees respond to
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21 different types of intrusions.
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26 Our research moves the conversation surrounding intrusions in a new direction by
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28 exploring the impact of intrusions on the extent to which employees engage in their own work
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30 and engage in work with others. However, there may be other mechanisms associated with
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32 intrusions that go beyond our model. For instance, intrusions may temporarily impact the attitude
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34 of the intruded-upon employee toward the intruder. Moreover, intrusions may increase an
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36 employee's sense of belongingness or perceptions of team-member exchange, which may shape
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38 a variety of employee outcomes.
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42 Although non-role intrusions did not benefit the employees in our study, non-role
43
44 communication could potentially foster beneficial employee outcomes that were not addressed in
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46 our data. For example, research indicates that these informal interactions may contribute to
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48 developing interpersonal relationships at work, given that they can lead to increased emotional
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50 support, personal growth, and job satisfaction (e.g., Colbert, Bono, & Purvanova, 2016). In
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52 addition, research has shown that small talk may lead to more positive social emotions at work
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(Methot et al., in press). Despite these benefits of non-role communication, our study suggests there is an appropriate time and place for these discussions.

Finally, we clarified the role intrusions play in the workplace by examining their effects on person-focused and task-focused citizenship. By showing the impact of intrusions on discretionary behavior, we provided a more complete picture of how desired employee behaviors are affected by intrusions. Nonetheless, citizenship is not the only relevant outcome that might be affected by intrusions. For instance, in-role intrusions may indirectly promote in-role performance through increased work engagement and collaboration, while non-role intrusions may disrupt employees' focus such that in-role performance is negatively impacted. Future research might explore the extent to which the gains in extra-role performance are offset (or complemented) by changes in in-role performance. It is also possible that different types of intrusions may have important relational consequences. Although non-role intrusions may temporarily disrupt employees' focus, these social interactions might act as social exchange deepeners, leading to feelings of social support that enhance employee well-being. Future research is needed to fully unpack the impact of intrusions on these employee outcomes.

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For Peer Review

FOOTNOTES

- 1 Jett & George (2003) define *interruptions* as an umbrella construct referring to incidents that impede or delay progress on work tasks. Different forms of interruptions may be differentiated based on two key factors: (1) how the interruption is initiated and (2) whether the interruption is directed at a specific referent. *Intrusions* are best thought of as interruptions initiated by other people and directed toward a specific person, such as a coworker stopping by your desk to gather a status update on a project. *Breaks* are interruptions initiated by the self, such as stepping out of the office to go for a walk. *Distractions* are generally initiated by external stimuli and do not have a specific referent, such as overhearing a loud conversation between two other employees across the hall (Jett & George, 2003).
- 2 To provide evidence of the state of the literature, we engaged in a coding of the literature that first involved conducting Google Scholar and Web of Science searches using the search terms “interruption” and “intrusion.” We note that the term “intrusion” is relatively uncommon in the literature, given that scholars have generally packaged all different types of interruptions (e.g., intrusions, distractions, and breaks) into a single “interruptions” bucket. We restricted our coding to articles that appeared in management, psychology, and general business journals. We further restricted coding to only include articles that conceptualized or operationalized interruptions as defined by Jett and George (e.g., incidents that impede or delay progress on work tasks). In all, we identified 42 articles. Of these articles, 29 articles characterized interruptions as solely negative, while 0 articles characterized interruptions as wholly positive. Of the 13 articles that suggested interruptions may lead to both positive and negative consequences, 8 examined their predictions empirically, and only 5 of those 8 investigated work interruptions in their natural setting (e.g., via field study). Of all the 42 articles we identified, only 3 empirically investigated “intrusions” specifically, as defined by Jett and George (2003). All 3 of these articles characterized intrusions as negative work experiences and, therefore, examined their negative consequences.
- 3 Given that intrusions can trigger affective responses (Butts, Becker, & Boswell, 2015; Frijda, 1986), each day employees completed five-item measures of both positive and negative affect (Mackinnon, Jorm, Christensen, Korten, Jacomb, & Rodgers, 1999). To demonstrate that our results were not affected by state affect, we performed a supplemental analysis that controlled for daily levels of positive and negative affect. Our pattern of results remained consistent and all hypotheses were supported at the same level of significance. Following previous guidance on the treatment and reporting of ineffectual control variables (e.g., Becker, 2005; Carlson & Wu, 2012), we report our final results excluding daily positive and negative affect.
- 4 To minimize participant burden associated with completing multiple daily surveys over consecutive days, we used shortened measures of work engagement, task-focused citizenship, and person-focused citizenship. In order to ensure adequate coverage of a conceptual domain utilizing shortened measures, scholars have recommended assessing the correlation between the short- and long-form measures (Smith, McCarthy, & Anderson, 2000). Thus, we performed a supplemental test with 100 participants from MTurk that asked

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participants to complete both our shortened measures and the original long-form measures. Participants earned a flat fee of \$1 for their participation. The correlations between all short- and long-form measures were high (work engagement = .91; task-focused citizenship = .94; person-focused citizenship = .96), providing support for our use of shortened measures.

- 5 Given the role that depletion may play in shaping employee responses to intrusions (e.g., Freeman & Muraven, 2010), we performed a supplemental analysis that controlled for daily levels of employee depletion. To facilitate this test, employees completed a five-item depletion measure (Lanaj et al., 2014) in the mid-day survey. Our pattern of results remained consistent when controlling for daily levels of depletion. Following previous guidance on the treatment and reporting of ineffectual control variables (e.g., Becker, 2005; Carlson & Wu, 2012), we report our final results excluding the daily depletion control.
- 6 Scholars have noted potential benefits of using Bayesian estimation in structural equation modeling (e.g., Asparouhov & Muthen, 2019, 2020). For instance, Bayesian estimation utilizes latent mean centering, which better accounts for measurement error when estimating within- and between-person variance compared to person-mean centering. As such, we also analyzed our Study 3 data utilizing Bayesian estimation. All substantive paths and significance levels were consistent with our primary analysis: non-role intrusions → work engagement = $-.05^*$; in-role intrusions → work engagement = $.14^*$; non-role intrusions → collaboration = $-.05$; in-role intrusions → collaboration = $.10^*$; work engagement → task-focused citizenship = $.17^*$; collaboration → person-focused citizenship = $.16^*$. * $p < .05$
- 7 To ensure robustness, we also analyzed our Study 3 data without lagged controls. All substantive paths and significance levels were consistent with our primary analysis: non-role intrusions → work engagement = $-.08^*$; in-role intrusions → work engagement = $.14^*$; non-role intrusions → collaboration = $-.04$; in-role intrusions → collaboration = $.14^*$; work engagement → task-focused citizenship = $.19^*$; collaboration → person-focused citizenship = $.14^*$. * $p < .05$

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Table 1

Study 1: Means, Standard Deviations, and Correlations

	Variable	Mean	SD	1	2	3	4
1	Non-Role Intrusions ^a	0.30	0.46	-			
2	In-Role Intrusions ^b	0.33	0.47	-	-		
3	Work Engagement	3.66	0.71	-.11*	.09*	(.93/.92)	
4	Collaboration	3.61	1.00	-.04	.07*	.46*	(.96/.95)

Note. Level 1 $n = 906$. Level 2 $n = 139$. Within-person correlations are reported among all variables. Coefficient alpha is provided as the first number along the diagonal. Multilevel alpha is provided as the second number along the diagonal.

^a Non-role intrusions coded as: 0 = Control condition, 1 = Non-role intrusions condition

^b In-role intrusions coded as: 0 = Control condition, 1 = In-role intrusions condition

* $p < .05$

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Table 2

Study 2: Means, Standard Deviations, and Correlations

	Variable	Mean	SD	1	2	3	4
1	Non-Role Intrusions ^a	0.50	0.50	-			
2	In-Role Intrusions ^b	0.47	0.50	-	-		
3	Work Engagement	5.37	0.77	-.19*	.22*	(.85)	
4	Collaboration	1.97	1.09	-.05	.41*	.29*	(.90)

Note. $n = 201$. Coefficient alpha is provided along the diagonal.

^a Non-role intrusions coded as: 0 = Control condition, 1 = Non-role intrusions condition

^b In-role intrusions coded as: 0 = Control condition, 1 = In-role intrusions condition

* $p < .05$

Table 3

Study 3: Variance Components of Null Models for Daily Variables

Variable	Within-Person Variance (ρ^2)	Between-Person Variance (τ_{00})	Percentage of Total Variance Within-Person
Non-Role Intrusions	0.45	0.27	63%
In-Role Intrusions	0.67	0.77	47%
Work Engagement	0.48	0.56	46%
Collaboration	0.66	1.28	34%
Task-Focused Citizenship	0.77	1.30	37%
Person-Focused Citizenship	0.81	0.97	46%

Note. Percentage of variability within-person was computed as $\rho^2 / (\rho^2 + \tau_{00})$.

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Table 4

Study 3: Means, Standard Deviations, and Correlations

	Variable	Mean	SD	1	2	3	4	5	6
1	Non-Role Intrusions	1.67	0.84	(.89/.86)					
2	In-Role Intrusions	2.37	1.21	.05	(.85/.84)				
3	Work Engagement	4.33	1.03	-.05	.14*	(.87/.75)			
4	Collaboration	4.17	1.40	-.03	.12*	.45*	(.92/.85)		
5	Task-Focused Citizenship	3.67	1.45	.09*	.03	.16*	.10	(.94/.86)	
6	Person-Focused Citizenship	3.90	1.34	.07*	.00	.07	.15	.49*	(.89/.84)

Note. Level 1 $n = 671$. Level 2 $n = 70$. Within-person correlations are reported among all variables. Coefficient alpha is provided as the first number along the diagonal. Multilevel alpha is provided as the second number along the diagonal.

* $p < .05$

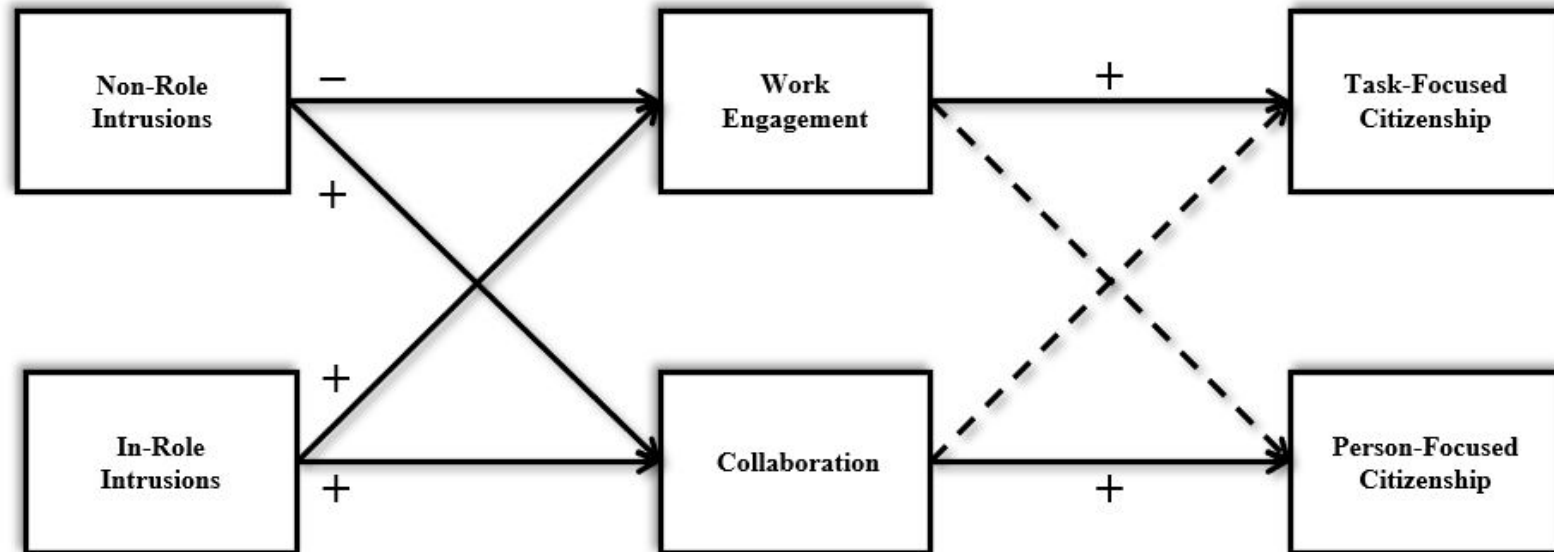
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Table 5
Study 3: Results of Multilevel Path Analysis

Variables	Work Engagement	Collaboration	Task-Focused Citizenship	Person-Focused Citizenship
	γ	γ	γ	γ
Intercept	4.19* (.19)	2.94* (.36)	2.53* (.43)	2.86* (.32)
Predictors				
Non-Role Intrusions	-.07* (.04)	-.06 (.06)	.14* (.06)	.11* (.03)
In-Role Intrusions	.14* (.06)	.11* (.05)	-.01 (.05)	-.03 (.05)
Mediators				
Work Engagement			.18* (.06)	.02 (.06)
Collaboration			.03 (.05)	.14* (.05)
Indirect Effects				
Non-Role Intrusions → Work Engagement			-.01 [-.036, -.001]	
In-Role Intrusions → Work Engagement			.03 [.006, .063]	
Non-Role Intrusions → Collaboration				-.01 [-.032, .007]
In-Role Intrusions → Collaboration				.02 [.002, .043]
Residual Variance	.41*	.55*	.75*	.81*
Pseudo R-squared	14.9%	16.1%	3.1%	.9%

Note. Parameter estimates are unstandardized; standard errors are in parentheses. The 95% bias corrected confidence intervals for the indirect effects are based on 20,000 Monte Carlo bootstrap samples. Significant indirect effects are bolded. Variances for the random slope estimates are: non-role intrusions—work engagement(.00, n.s.); in-role intrusions—work engagement (.08, $p < .05$); non-role intrusions—collaboration (.05, $p < .05$); in-role intrusions—collaboration (.03, n.s.); work engagement—task-focused citizenship (.00, n.s.); collaboration—person-focused citizenship (.00, n.s.).
* $p < .05$.

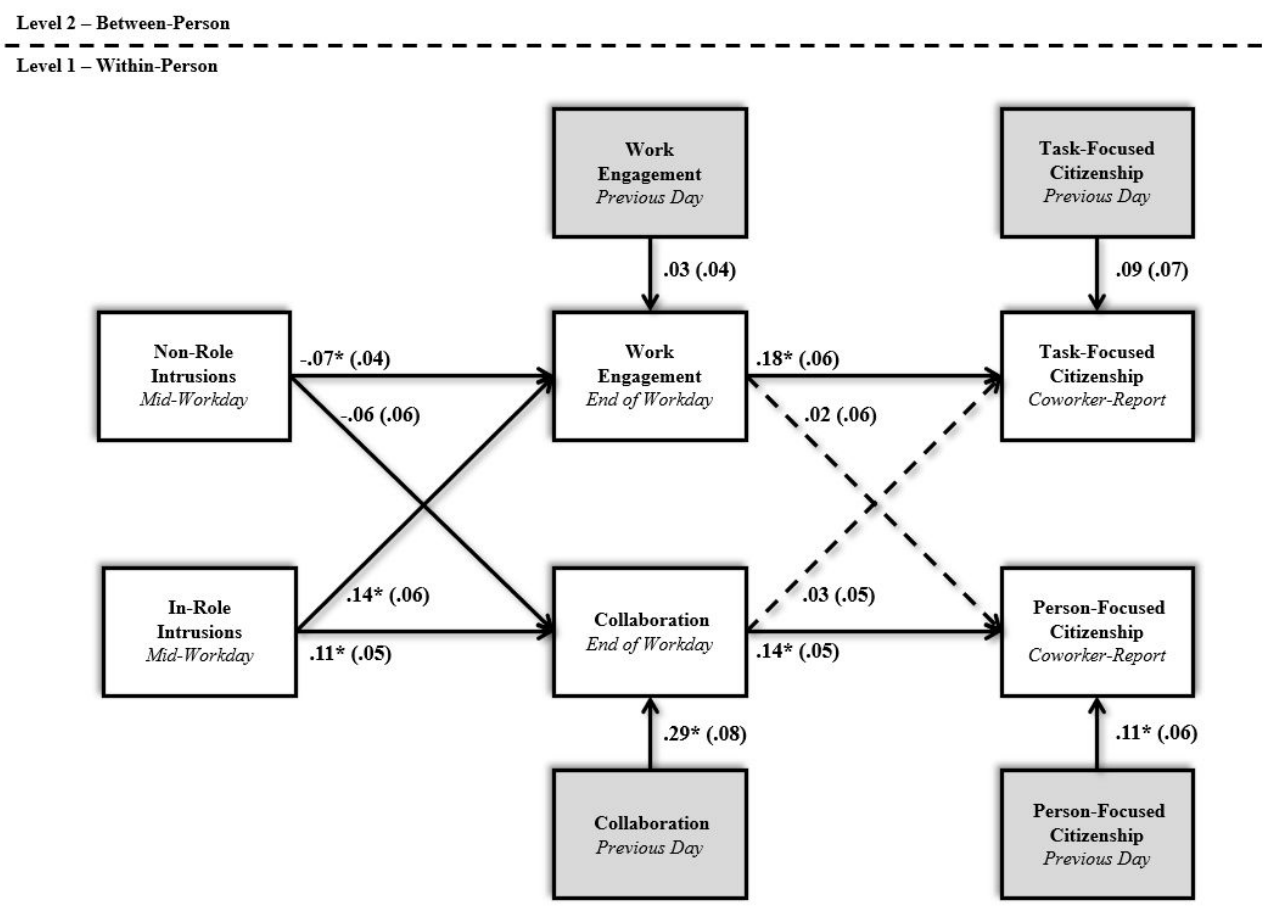
Figure 1
Conceptual Model



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Figure 2

Study 3: Path Analysis Results



Note. Level 1 $n = 671$. Level 2 $n = 70$. Standard errors are in parentheses. Although not shown, we also modeled direct effects from intrusions to both types of citizenship behavior, as modeling those paths protects against biased indirect effects. For clarity, those paths were omitted from the figure. Path coefficients for those direct effects are: non-role intrusions → task-focused citizenship = .14*; in-role intrusions → task-focused citizenship = -.01; non-role intrusions → person-focused citizenship = .11*; in-role intrusions → person-focused citizenship = -.03. * $p < .05$

Responses to Editor

As you will see below, the reviewers were pleased with the improvements to your manuscript. I also want to thank you for a responsive and effective revision. Your research makes a timely and practical contribution to the literature, while also paving the way for future work in this area. Therefore, I am pleased to conditionally accept your manuscript for publication, conditioned on resolution of the minor issues noted below.

We were extremely pleased to learn our paper had been conditionally accepted! We are very appreciative of the helpful feedback from the review team throughout this process. In particular, we appreciate your clear guidance on how to implement the reviewers' suggestions. As noted below, we now include a practical implications section and more information regarding the length of time participants spent completing Study 2.

1. Reviewer 1 would like you to add a sentence regarding the length of time participants had to complete the transcription tasks in Study 2.

We appreciate this recommendation and now include the average time spent for participants across each condition in the Study 2 procedure (pp. 22-23).

2. Your research has important practical implications (which you describe on pages 34 and 35), but they sort of get lost in the General Discussion section. Therefore, I would like you to consider adding a "Practical Implications" subheading. However, the last paragraph on page 35 (regarding the possible development of interpersonal relationships) seems like it would fit more naturally with the section on Limitations and Suggestions for Future Research, so I would like you to consider moving it there.

Thank you for these recommendations. We now include a section titled "Practical Implications" in our discussion section (pp. 37-38). In addition, we moved our previous discussion of the role of interpersonal relationships to our "Limitations and Suggestions for Future Research" section (pp. 39-40).

As one final point, we added a quotation to the beginning of the paper. Tim Cook of Apple recently gave an interview about returning to work after that pandemic that we believe is highly relevant to our paper. We would like to include this quote at the beginning, as it highlights the timeliness of our research.

"My gut says that, for us, it's still very important to physically be in touch with one another because collaboration isn't always a planned activity." – Tim Cook, CEO of Apple, in reference to returning to the workplace post-2020 coronavirus pandemic

If you would prefer, however, we will remove the quotation when submitting the final version.