© *Academy of Management Journal*
2020, Vol. 63, No. 5, 1395–1424.
https://doi.org/10.5465/amj.2018.0466

VIRTUALLY (IN)SEPARABLE: THE CENTRALITY OF RELATIONAL CADENCE IN THE FORMATION OF VIRTUAL MULTIPLEX RELATIONSHIPS

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The increasing use of technology and rise of virtual work has fundamentally changed how employees interact with each other. No longer can employees reliably predict when and where their coworkers will work, transforming the very ways in which coworker relationships unfold over time. This is perhaps especially true for coworker multiplex relationships, which fuse a coworker relationship with a friendship relationship and strongly affect job satisfaction and turnover intentions. Through a qualitative study of a Fortune 500 technology firm with a largely remote workforce, we build theory on how virtual coworkers form friendships with each other on the path to multiplexity. Our emergent theory reveals the centrality of "relational cadence"—perceived convergence in the patterns of interaction between oneself and a particular coworker—to the establishment and growth of these relationships. It also differentiates work-related from friendship-related cadence, stresses the symbiosis of these cadences in multiplexity, and emphasizes the importance of temporal rhythm and understanding relational particulars (the nature of the specific coworker relationship) in the development of each form of cadence. These findings highlight how virtualization affects the experience of relating at work, and thereby make important contributions to literatures on relationships at work, coworker friendships, and virtual relationships.

> My number one thing [about working virtually] is I love the autonomy. It's extremely efficient and is awesome that we have the ability to use our phones or use laptops or call people. . . But at the end of the day, the most important thing is the interpersonal relationship. (Lauren, experienced hire)

We are indebted to Associate Editor Katy DeCelles for her masterful stewardship of this manuscript, and to the three anonymous reviewers who improved this paper at every round. We also deeply appreciate the very helpful comments of Rachel Balven, Jean Bartunek, Shelley Brickson, Mary Ann Glynn, Emily Heaphy, Jessica Methot, Julianna Pillemer, Lakshmi Ramarajan, Kristie Rogers, Ned Wellman, and audience members of presentations at Arizona State University, Boston College, and Wayne State University. This work benefitted greatly from generous grants from the Department of Management & Entrepreneurship at Arizona State University's W. P. Carey School of Business, the Arizona State University Graduate and Professional Student Association Jumpstart and Graduate Research Support Programs.

Work organizations are fertile grounds for the growth of friendships (Boyd & Taylor, 1998; Kram & Isabella, 1985; Sias & Cahill, 1998). Aside from meeting individuals' fundamental need to belong (Baumeister & Leary, 1995), coworker friendships—defined as "non-romantic, voluntary, and informal relationships between current coworkers that are characterized by communal norms and socioemotional goals" (Pillemer & Rothbard, 2018: 637)—help facilitate important organizational processes and outcomes. Friends are more likely to communicate with each other and provide information, such as organizational norms (Brass, 1984; Krackhardt & Kilduff, 1990; Lincoln & Miller, 1979). Employees who have even the opportunity to make friends at work have higher job satisfaction and organizational commitment, and lower absenteeism and intentions to turnover (Humphrey, Nahrgang, & Morgeson, 2007; Morrison, 2004; Riordan & Griffeth, 1995). In short, when friendship is paired with an interdependent working relationship—known as a "multiplex relationship"—it

generally enhances job performance (Kilduff & Tsai, 2003; Methot, Lepine, Podsakoff, & Christian, 2016).

However, the increasing use of technology and the rise of virtual work, or working physically apart from coworkers and interacting primarily via communication technologies (Gibson & Gibbs, 2006; Raghuram, Hill, Gibbs, & Maruping, 2019), have fundamentally changed how employees connect and form multiplex relationships. No longer do they necessarily work side by side in a collocated context each day (Gilson, Maynard, Young, Vartiainen, & Hakonen, 2015; Raghuram et al., 2019). Even something as fundamental as when the workday starts and ends—once a defining characteristic of the 9 a.m.–5 p.m. workplace—may no longer be the norm (Begole, Tang, Smith, & Yankelovich, 2002; Cummings, Espinosa, & Pickering, 2009; Perlow, 1999). Instead, coworkers can work from anywhere—coworking spaces, client sites, their homes, or even coffee shops—at any time (Reid, 2015; Spreitzer, Cameron, & Garrett, 2017). While this opens the door to interactions across locations previously out of reach, it challenges what we know about how multiplex relationships form. Most importantly, working virtually renders moot one of the bedrocks of friendship—geographic proximity (Fehr, 1996; Hays, 1985; Sias, Pedersen, Gallagher, & Kopaneva, 2012). Geographic proximity enables opportunities to create shared experiences, which can be both organizationally sanctioned (e.g., corporate volunteering programs, company-sponsored social events [Dumas, Phillips, & Rothbard, 2013; Grant, 2012; Rodell, Booth, Lynch, & Zipay, 2017]) and informal or emergent (e.g., water cooler talk, informal lunches, happy hours [Ingram & Morris, 2007; Lin & Kwantes, 2015; Oh, Chung, & Labianca, 2004]). Such in-person shared experiences have historically facilitated fundamental processes in coworker friendship formation; for instance, self-disclosure (Pillemer & Rothbard, 2018), meeting friends through other friends (Parks & Eggert, 1991), and assessing physical attractiveness (Fehr, 1996).

Absent in-person shared experiences, potential coworker friends solely interact via communication technology, such as e-mail, text message, instant message, and social media (Sias et al., 2012). This changes the nature of relating. In particular, it makes it harder for individuals to convey and understand the social context of a given interaction, including relevant geographic, organizational, and situational information (Culnana & Markus, 1987; Sproull & Kiesler, 1986). Yet this social context information often abets perceptions of friendship potential, such as perceived similarity (Brehm, 1956; Pillemer & Rothbard, 2018). Further, the behaviors that build trust, and ultimately friendship—mutual availability and responsiveness (Altman & Taylor, 1973; Fehr, 1996)—are perhaps those most impacted by geographic dispersion (Gilson et al., 2015; Henttonen & Blomqvist, 2005).

Curiously, though, it appears that individuals can, over time, perceive the same socioemotional benefits from virtual relationships as they do from in-person ones (Gajendran & Harrison, 2007; Weiner & Hannum, 2012). This is particularly true when communicating via "rich" media, or for those with an aptitude for communicating via technology (Carlson & Zmud, 1999; Chan & Cheng, 2004; Makarius & Larson, 2017; Walther, 1995). For example, research has found that virtual team members can establish a fragile form of "swift trust" that may eventually grow into high levels of trust (Jarvenpaa & Leidner, 1999). These findings suggest that virtual workers have somehow adapted to form viable and rewarding multiplex relationships in ways that our current theories do not fully explain (Raghuram, Garud, Wiesenfeld, & Gupta, 2001; Staples, Hulland, & Higgins, 1999).

In this study, we begin to build this theoretical understanding through an inductive, longitudinal, empirically-grounded study (Charmaz, 2006; Strauss & Corbin, 1998) with the Midwest division field office of a large, highly virtual Fortune 500 technology firm ("Cloudly"—a pseudonym). As discussed in our Findings, our emergent theory suggests that, without the guarantee of in-person interaction to participate in memorable shared experiences and convey social context information, Cloudly members were particularly attuned to assessing and intentionally cultivating "relational cadence"—defined as perceived convergence in the patterns of interaction between oneself and a particular coworker. Relational cadence reflects individuals' perception of both when interactions predictably unfold (i.e., temporal rhythm, a "reliable repertoire of what is expected, likely, or unlikely to take place within certain temporal boundaries" [Zerubavel, 1981: 12]) and the nature of the specific coworker relationship (i.e., the "relational particulars" associated with the relationship) that shapes patterns of interaction. Further, while extant scholarship has tended to decouple the trajectory of the working relationship from that of the coworker friendship, our findings highlight that virtual coworker friendships are typically multiplex rather than nonmultiplex (i.e., solely a friendship relationship within an organizational context). This renders the two relationships largely impossible to decouple when forged virtually, and necessitates the foundation of multiplex cadence, which includes both

"work-related cadence" (perceived convergence in the patterns of work-related interaction) and "friendship-related cadence" (perceived convergence in the patterns of personal interaction). Ultimately, establishing multiplex cadence provides virtual workers with a relationship from which they can meaningfully and reliably interact with each other in ways that both transcend and enhance the working relationship.

BECOMING FRIENDS WHEN WORKING VIRTUALLY

The Coworker Friendship Formation Process

When describing how coworkers become friends in organizations—with potential for multiplexity (if work interdependence exists)—scholars have specified a stage model in which relationships organically progress from an exploration stage (i.e., acquaintances) to a casual friendship, a close friendship, and, finally, an "almost best" friendship (Boyd & Taylor, 1998; Fehr, 1996; Kram & Isabella, 1985; Sias & Cahill, 1998; cf. Ferris, Liden, Munyon, Summers, Basik, & Buckley, 2009). In the first stage of friendship formation, coworkers orient themselves to each other as they interact, naturally investigating the degree of perceived similarity and weighing the potential rewards and costs associated with becoming friends (Altman & Taylor, 1973; Thibaut & Kelley, 1959). Research has found that proximity, shared tasks, and extraorganizational socializing are the most important factors that facilitate perceived similarity and interpersonal rewards and costs (Boyd & Taylor, 1998; Sias & Cahill, 1998). When coworkers perceive similarity and that the rewards of becoming friends outweigh the costs, they instinctively increase self-disclosure about life events and work-related problems. This coincides with decreased caution, increased liking, and greater intimacy, typically signaling the transition to a friendship in stage models. Finally, as coworkers continue to perceive similarity, disclose information, and develop an enduring sense of mutuality and trust, the relationship often progresses into a close or best friendship (Ferris et al., 2009; Kram & Isabella, 1985; Sias & Cahill, 1998; Taylor, Hanlon, & Boyd, 1992)

However, stage models of coworker friendship formation have largely based their theorizing on samples of employees with everyday face-to-face contact. Perhaps as a result, management scholars often define and measure coworker friends as those with whom employees socialize outside of work (e.g., Ibarra, 1992; Mehra, Kilduff, & Brass, 2001; Methot et al., 2016). Yet, as mentioned, the increasing virtualization of work often strips the workforce of regular—or perhaps of any—in-person opportunities to meet (Lin & Kwantes, 2015; Sias et al., 2012). This transformation of interaction context from in person to technology based is likely one of the most impactful in shaping how friendships, and, ultimately, multiplex relationships, unfold.

How Virtuality Changes Coworker Interactions

As stated above, forming virtual coworker friendships differs greatly from forming in-person friendships in two important ways: the lack of in-person shared experiences and the heavy reliance on technology. Both conditions significantly transform the friendship formation process.

In the first stage, as noted above, individuals focus on the potential of a coworker to be a friend, paying particular attention to perceived similarity and the rewards and costs of becoming friends (Altman & Taylor, 1973; Boyd & Taylor, 1998; Thibaut & Kelley, 1959). Understanding who a colleague is when interacting in person is relatively straightforward; doing so via communication technologies is less so. For example, Hinds and Bailey (2003) found that geographic separation reduces both similarity and familiarity between colleagues, makes it harder to coorient in a given context, and reduces friendship between virtual workers. This suggests that how individuals come to understand and assess others in a potential friendship relationship likely differs between a virtual coworker and a collocated coworker.

Moreover, the dearth of in-person shared experiences and the reliance on virtual communication tools transforms the primary driver of friendship growth—self-disclosure (Pillemer & Rothbard, 2018; Sias et al., 2012)—throughout the rest of the friendship stages. Whereas in-person shared experiences translate to direct (i.e., face-to-face) self-disclosure, the restriction of social context cues when disclosing via communication media complicates what coworkers communicate and how that communication is received (Daft & Lengel, 1986; Short, Williams, & Christie, 1976). As but one example, Byron and Baldridge (2007) found that readers interpreted the same emotional cues in e-mails differently. Further, virtual colleagues may rely more on social media to understand their coworkers versus those with access to in-person interactions. Yet research suggests that self-disclosure via social media tends not to be tailored to any specific coworker (McFarland & Ployhart, 2015;

Ollier-Malaterre, Rothbard, & Berg, 2013). Disclosing via social media therefore tends to be less effective in developing rich and authentic relationships than does disclosing via face-to-face communication.

How do we reconcile the findings that virtual workers do indeed form multiplex coworker relationships if our current theories largely suggest that remote work impairs friendship formation? We accordingly entered the field with the research question: How do virtual coworkers become friends and thus form multiplex relationships?

METHOD

To answer this question, we conducted a longitudinal inductive study using grounded theory methodology (Charmaz, 2006; Strauss & Corbin, 1998). A grounded theory approach is appropriate for understanding phenomena that are theoretically underdeveloped and processual, such as virtual multiplex relationships (O'Reilly, Paper, & Marx, 2012).

Overview of Context

We collected data in the Central Division (Midwest) of Cloudly, a global technology corporation headquartered in the Northeast United States. At the time of data collection, Cloudly had over 70,000 employees worldwide, with approximately 900 based in the Midwest. While some employees of Cloudly's Midwest field division were purely virtual (working remotely 100% of the time), the majority were members of "hybrid" virtual teams, meaning they potentially had some opportunity to interact with team members in person.[1] Given our focus on the friendship portion of multiplex relationships, we chose to study virtual coworkers at Cloudly because it was a highly virtual organization that was often described by organizational members as a great place to work and make friends.

[1] Informants noted that the extent to which they interacted in person varied from week to week (depending on individual preferences), month to month (depending on how often their team got together in person), and on an annual basis (depending on whether they worked in a different country or were allocated 100% in the field). This is in line with research suggesting that most virtual teams are likely to be hybrid (rather than purely virtual or traditional face-to-face), varying in the extent to which individuals rely on computer-mediated communication or are geographically dispersed (Fiol & O'Connor, 2005; Griffith, Sawyer, & Neale, 2003; Mathieu, Maynard, Rapp, & Gilson, 2008).

We drew informants from the sales and customer service divisions. The Human Resources (HR) department identified these divisions as particularly geographically dispersed and friendly. Cloudly did not have a formal onboarding program where team members interacted with their colleagues in a face-to-face milieu for team-building purposes. As a result, informants often began working with their virtual colleagues without ever meeting in person. In both divisions, teams held weekly meetings. In the customer service division, these were primarily via conference call. In the sales organization, these were often held in person, with dispersed members calling in via phone. For virtual workers, face-to-face interaction opportunities were rare. The most reliable opportunity was a team's Quarterly Business Review, when some (but not all) members would join in person to review progress toward goals and share best practices. These meetings typically consisted of a business and social component (e.g., happy hour). Yet even these meetings were increasingly virtual, with the practice of traveling to them becoming less frequent.

The type and structure of work performed differed by function and division. Those in the sales division held the following roles: inside sales, presales system engineer, sales representative, administrative support for sales, or management. The sales organization was highly matrixed. Individuals were on teams with others in the same role (e.g., a team of sales representatives), but worked across functions as required by their clients, within both the sales organization and Cloudly more broadly. Individuals in the sales division had quarterly sales goals but relied heavily on each other to meet those goals. Informants in the customer service division were responsible for working with clients after the purchase of Cloudly equipment and services. They held the roles of senior account manager, customer service engineer, account service representative, or manager. Like the sales organization, the customer service division was highly matrixed. Individuals were on teams with others in the same role (e.g., customer service engineers), but were assigned to a specific client where they worked together to ensure the client's satisfaction. Members of the customer service division were collectively held responsible for the service provided to clients.

In communicating with each other, Cloudly employees had access to e-mail and phone calls, but relied heavily on text messaging, Webex (an online conferencing tool that allowed users to share their computer screens), and the internal instant messaging features of Skype. Although these applications support video conferencing, informants noted that

they rarely, if ever, used that feature. They provided two rationales: (1) no one wanted to be caught off-guard—"in bed, in my pajamas" (Teresa; EH)[2]; and (2) they spent a significant amount of time driving between current or potential client sites (called "windshield time"; Richard; NH), during which video conferencing was unsafe. They thus described video conferencing tools, such as Skype or FaceTime, as counternormative to Cloudly's culture (e.g., "Actually it's kind of funny; if you look at like about 90% of the laptops, people. . . tape over their video," Walter; EH). One informant (Megan; EH) even noted that her manager tried to institute video conferencing for team meetings, but no one used it. Ultimately, the team returned to phone calls.

Data Collection

Our principal data source was open-ended, semi-structured interviews. The first author completed 114 interviews, ranging from 18–86 minutes, with the average lasting 40 minutes. We engaged a professional transcription service and redacted all identifying information.

Our total sample of 64 individuals included two groups: a longitudinal sample of 28 "transitioning" informants interviewed at three points in time and a cross-sectional sample of 36 "experienced hire" informants interviewed once. Our longitudinal sample was particularly important given that we were interested in the formation of multiplex relationships over time and wanted to capture these dynamics from their inception. We thus purposefully sampled "transitioning" individuals (i.e., those who were newly hired or transitioning internally to a new role at Cloudly) as our longitudinal participants. To our knowledge, our HR contacts invited every newly hired or transitioning employee of the sales and customer service divisions of the Midwest office to participate in the study during the time of data collection. We interviewed 16 new hires and 12 role transitioners for a total of 78 longitudinal interviews. Our second sample of 36 "experienced hire" informants provided a better understanding of the context and had more experience with coworker relationships at Cloudly. Based on conversations with key informants in HR, we purposefully selected experienced hires who spanned: (1) organizational levels, (2) organizational tenure, (3) gender, and (4) function. Figure 1 summarizes our interview count.

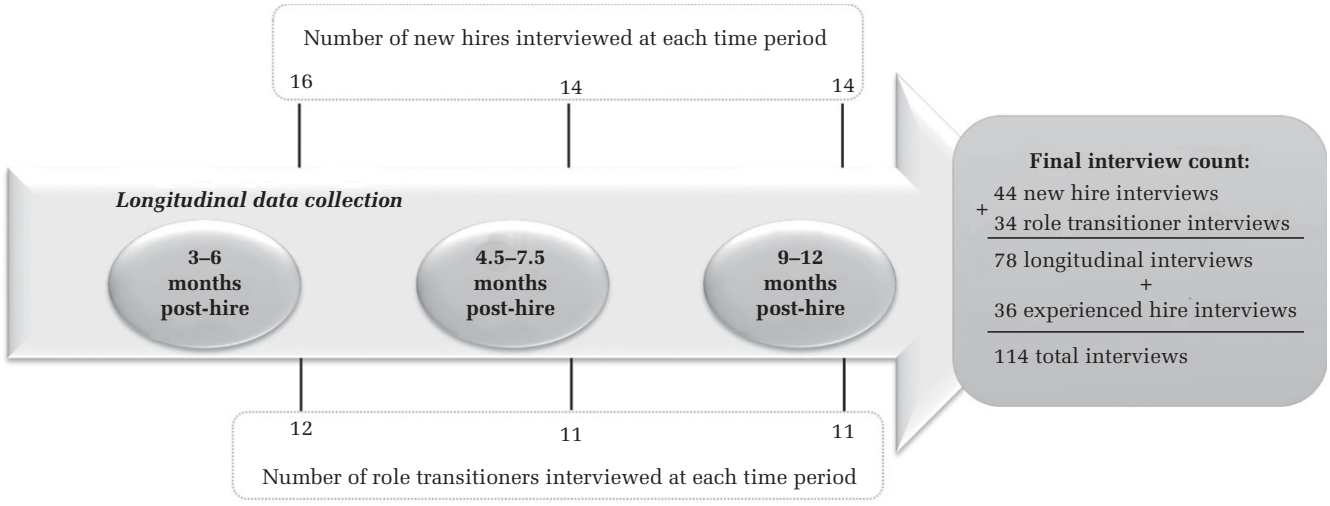
The average tenure for experienced hires in our sample was 7.4 years, and for internal role transitioners, 6.9 years. Of the total sample, 25% of new hires, 50% of role transitioners, and 18% of experienced hires were formal supervisors. Females comprised 7% of new hires, 9% of role transitioners, and 30% of experienced hires (the average percentage of females in the total IT industry is approximately 30% [Bureau of Labor Statistics, 2016]). Participants were high-intensity telecommuters, meaning they described working physically away from coworkers at least 50% of the time (Gajendran & Harrison, 2007), thus relying heavily on technology to interact with each other (likely far more than 50% of the time). On average, new hires cited their percentage of virtuality as 60%, role transitioners as 62%, and experienced hires as 67%.[3] Participation in the study was voluntary and individuals did not receive compensation.

Research across various disciplines has indicated that close workplace friendships tend to form within six weeks (Hays, 1985), leaders and followers often form differentiated relationships within eight weeks (Nahrgang, Morgeson, & Ilies, 2009), and friendships may deteriorate within a year (Sias, Heath, Perry, Silva, & Fix, 2004), all of which suggests that these multiplex dynamics may unfold quickly. Our initial plan was to longitudinally interview informants within six weeks, 12 weeks, and 24 weeks of starting their new role. However, within the first few interviews we realized that friendship dynamics developed more slowly than anticipated (i.e., some of our initial informants did not have coworker friendships to describe in their first and second interviews; "I don't know how far we can deep dive on anybody just because of the fact that I don't know them very well," Ray; NH1), likely because these relationships were largely mediated by communication technologies (Wilson, Straus, & McEvily, 2006). We subsequently revised our sampling strategy to best capture virtual friendship formation (Strauss & Corbin, 1998). We conducted time 1 interviews within 3–6 months of hire, time 2 interviews 4.5–7.5 months after hire (approximately

[2] We use pseudonyms to preserve the anonymity of our informants. After each pseudonym, we use "NH" to denote new hire, "EH" to denote experienced hire, and "RT" to denote role transitioner. For those interviewed multiple times (see rationale below), we specify the interview in which the quote occurred. For example, "Ashley; NH2" signifies new hire Ashley's second interview.

[3] Informants often qualified these estimates by saying that they are hard to calculate and highly variable. For example, they might stop by the office for an hour on their way to a customer site, but would count that as a day in the office.

FIGURE 1
Timing of Longitudinal Interviews with New Hires and Role Transitioners,[a] and Interview Count



[a] One role transition informant did not respond to requests for the second and third interviews; two new hires did not respond to second-round interviews; and two different new hires did not respond to third-round interviews. We thus had a total of 28 round 1 interviews, 25 round 2 interviews, and 25 round 3 interviews.

six weeks after time 1), and time 3 interviews 9 months–1 year after hire (approximately six months after time 1). We began by concurrently interviewing all three types of informants in our sample (experienced hires, new hires, and role transitioners). By time 3, we concluded that our general understanding of Cloudly was sufficient and focused solely on our longitudinal sample. Online Appendices A and B provide the final interview protocol for each sample.[4]

Because coworker friendship is a subjective concept existing on a fine-grained continuum (Boyd & Taylor, 1998; Sias & Cahill, 1998), informants often seamlessly transitioned between stories of acquaintances and those of actual coworker friends. To ensure clarity, the first author asked informants how they defined coworker friendships, whether the informant would consider the individual a friend, whether the identified friend shared work-related tasks (i.e., a multiplex relationship), and how such relationships differed from noncoworker friendships.

Additional sources of data: Observation and archival materials. We collected multiple sources of data to comprehend more completely virtual coworker multiplexity, as well as to ensure the trustworthiness of our emergent theory (Lincoln & Guba, 1985; Marshall & Rossman, 2006). To understand the organizational context and our informants, the first author engaged in more than 75 hours of observation. Observation included sitting in a hoteling cubicle and working alongside those in the office, attending a two-day Quarterly Business Review and its subsequent happy hour, and observing a division's annual kick-off meeting, among other events. The first author also met regularly with HR contacts to stay abreast of company happenings (e.g., holiday toy drives, corporate volunteering days, large-scale meetings). The author team thoroughly debriefed after each field site visit. HR and interview informants also passed along relevant archival materials, such as HR policies, a video that an intern had created on Cloudly's culture, and photos.

Data Analysis

We began our formal data analysis by reading all three interviews from the longitudinal sample and constructing memos on each. To understand whether there were meaningful differences in friendship formation between new hires and role transitioners, we read transcripts from and memoed all of the new hire interviews first, followed by the role transitioners. This gave us a high-level sense of virtual coworker friendship dynamics over time and potential differences between our samples. We then used NVivo 10 to code the data. The first author conducted the primary analysis, but frequently engaged the author team to discuss

[4] Appendices can be found at: https://osf.io/q3jyn/?view_only=c54a0fdc0b11415ba6ca7d4cd0b7e7bc

insights. We began with open coding, or coding anything relevant to virtual coworker friendship formation (Glaser & Strauss, 1967). For example, two open codes were "picturing someone" and "judging voice."

We then moved to more focused coding, or selectively coding concepts of relevance. Focused coding helped to highlight the data still needed to understand virtual coworker friendship formation, and often prompted us to refine our interview protocols.

We next engaged in axial coding, which helped us to clarify the relationships between our initial codes and generate categories (Charmaz, 2006; Strauss & Corbin, 1998). Returning to the example above, picturing someone and judging voice were coded as dimensions of the axial code "imagination." Axial coding also helped to reveal the multiplex nature of our informants' work friendships and the emergence of cadence as a key mechanism of that multiplexity. In the spirit of constant comparison, once we had established preliminary categories we returned to data collection to theoretically sample and flesh out the details of the emergent relationships.

We ended the concurrent processes of data collection and analysis when we reached theoretical saturation, or the point at which no new properties of the emergent categories surfaced (Glaser & Strauss, 1967). Because we studied individuals over time, we continued interviews through time 3 to ensure that we achieved saturation for all aspects of our theorizing. The first author also kept rigorous field notes and engaged in memo writing throughout the process (Charmaz, 2006). Memos ranged from half a page to three pages, equating to 127 pages in total.

FINDINGS

In this section, we articulate the virtual multiplex relationship formation process as it unfolded for our informants. To preview, informants described the importance of understanding a coworker's potential for work- and (if desired) friendship-related interaction patterns that converged with their own—in terms of both temporality and relational particulars. When there was no promise of convergence, relationship progression typically halted. However, when promising, informants undertook additional activities to cultivate work- or friendship-related cadence. Over time, the development of work- and friendship-related cadence facilitated trust, mutuality, and perceived similarity—the hallmarks of a multiplex relationship—between the virtual coworkers.

Virtuality at Work: A Breakdown in Cadence

Cadence emerged early in our data collection when we realized that informants often experienced virtuality as a "barrier" (Akshay; NH1) to establishing convergence in patterns of interaction. For example, new hire Cooper noted in his first interview: "Obviously, it's hard when you're not face-to-face with people on a regular basis to be able to develop any sort of a regular cadence or a relationship with them." This appeared particularly true for Cooper when it came to a personalized relationship, such as a friendship:

> In a work atmosphere with the virtual environment, the one thing I would say is you don't have as intimate, if you will, a relationship with your coworkers as maybe you did in the past... I think there's kind of a little bit of a lull there, knowing the level of separation.

This finding prompted us to explore why working virtually impeded cadence for our informants.

Challenges to establishing a temporal rhythm. Given the asynchronicity that defines virtual work (Gibson & Gibbs, 2006; Short et al., 1976), it is perhaps not surprising that we often heard how hard it was for our informants to establish a temporal rhythm with virtual colleagues. Communicating with individuals all over the world via technology made it significantly more challenging to connect quickly and regularly, as noted by this manager:

> The virtual ones, you have to be diligent... If you don't set aside the time with virtual employees, you're never going to be able to actually stick to continuing communication and there's going to be a breakdown in communication. (Nathan; EH)

Even if time was set aside to connect, there was no guarantee of a response. Informants lamented that connecting was not easy:

> It's just because [of] the communication barrier that distance creates and technology creates, like even though you have a phone, you can pick up and call them anytime you want, you call and you don't get an answer or whatever. (Keith; NH1)

The seeming ease and frequency of not responding left informants with a sense of one-sidedness, a blatant divergence from the mutuality that defines perceived convergence: "If somebody sends you a question or something and then a whole day goes by and you don't get a response, you're kinda like, 'did anybody see that? Is anyone workin' on it?'" (Angela; EH). This was perhaps most frustrating when individuals needed an immediate response:

> Because when something bad happens, and it's after hours. . . you try to call your coworker and they don't answer. . . Then you call into our services. . . and you say, "Hey I need help," and they'll say, "Okay, yeah, we'll help you out" and then you don't get a call back for two hours. . . you just feel alone. (Joseph; EH)

While in a collocated office it is rather easy to see whether colleagues are busy by walking past their workstations, informants described how virtuality undermined their ability to assess coworker availability, an important step in understanding how patterns of interaction might converge. Angela (EH) noted this frustration when discussing a coworker in another state:

> It is a little more difficult working with her because you're not sure what she's doing at the time. . . you don't know if she's busy with people at the front desk or not. So [it's hard] if you're trying to call her and ask her questions.

Challenges to situated coworker familiarity. The social context provides individuals with vital information about their interaction partner and situational norms (Sproull & Kiesler, 1986). Communicating via technology often makes it more challenging to send and receive this information (Daft & Lengel, 1986; Short et al., 1976). However, research has suggested that these very cues are crucial for friendship, and thus multiplex relationship, development (Sias, 2009). In a study of virtual workers visiting colleagues in person, Hinds and Cramton (2014) found that friendships formed when colleagues developed a deeper sense of situated coworker familiarity during in-person site visits. Situated coworker familiarity is a "multiplex understanding that coworkers have of their counterparts in relation to themselves" and their interaction patterns (Hinds & Cramton, 2014: 797). Members of Cloudly often expressed frustration with not being able to foster such familiarity with their remote colleagues:

> It's definitely a challenge. I'm used to being able to gauge people face-to-face and get a better feel for what they're thinking about what I'm saying—and all the nonverbal cues. So it's a little bit more challenging to pick that up over the phone or e-mail or instant message. It will take some getting used to. (Edward; NH1)

In particular, they described how working virtually imposed a sense of formality on coworker relationships, constraining their ability to gain situated coworker familiarity:

> Everything is virtual. Which is good and bad, right? You get a chance to talk to them, but it's very formalized. It's very rushed and jam-packed full of information because everybody's got so much stuff going on. And it's just a little impersonal. (Jacob; NH2)

Perceptions of formality arose from subtle cues that remote work was about increasing efficiency and autonomy, and decreasing costs: "they have people completely working remote, and they highly push that as a cost-saving thing obviously, right? That's why they want that" (Thomas; NH3). They also arose from feeling "watched" or "tracked"—or, as one individual stated, "when you're in a virtual meeting, or even if it's just one-on-one, there's kind of this, 'Hey, who else is watching? Is this being recorded?'" (Gary; NH1). Even if management did not intend for these cues to alter interactions, they did:

> It's hard because you're so focused on your business [that] if there's not something that you're exactly looking for or trying to grow from, I don't necessarily go out and seek that [a friendship] unless it's a need. (Lauren; EH)

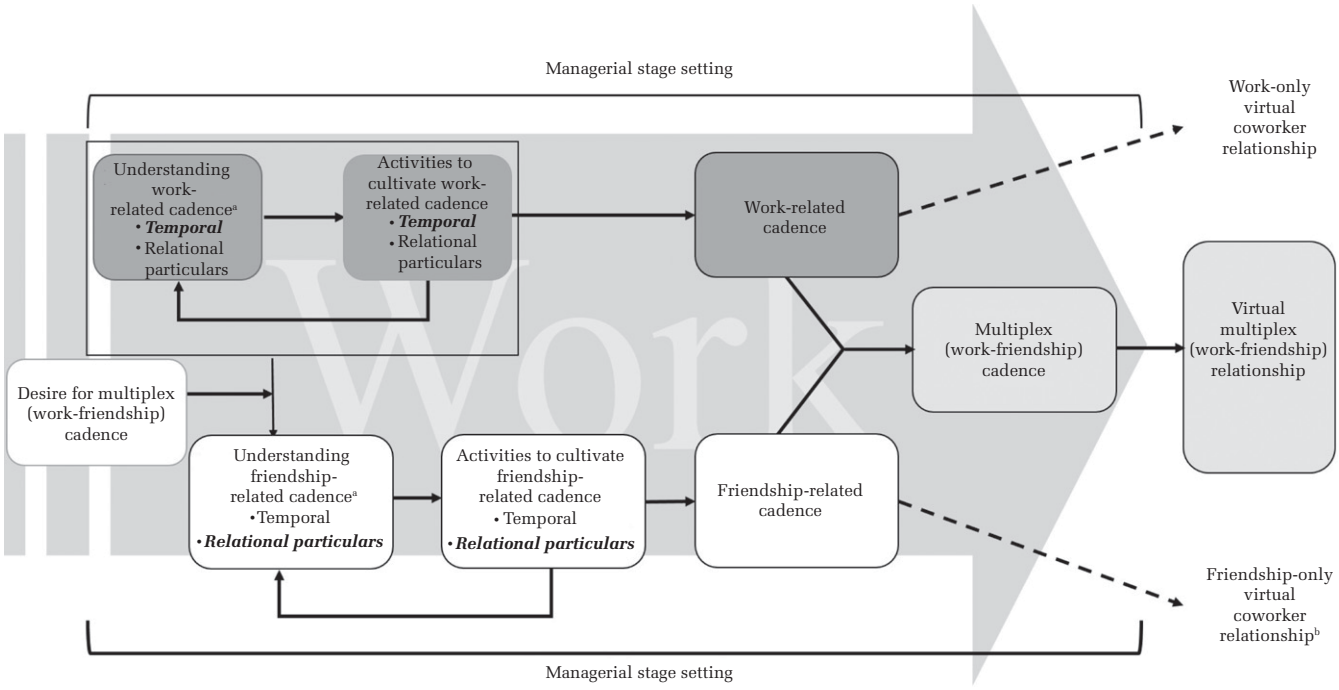
Surmounting the Barrier of Virtuality: A Model of Cultivating Work- and Friendship-Related Cadence in Virtual Coworker Relationships

As depicted in Figure 2, Cloudly members described a largely intentional process through which they cultivated (or did not cultivate) work- and friendship-related cadence by first assessing cadence potential, the outcomes of which facilitated (or stymied) activities to cultivate cadence.

Our model of cultivating cadence begins with work-related cadence because nearly all of our informants described how there is often no reason for interacting with a virtual colleague unless for work—"we basically have interaction because we share customers" (Ashley; NH1); "It's just work, like you're communicating with them because you're dealing with them for work-related tasks, right?" (Adit; NH1). That said, a few informants did describe friendships that developed without work-related cadence. This usually occurred when individuals first met in person (e.g., at a conference or in a previous role). We thus surmise that virtual coworker friendship typically depends on work-related interaction.

Understanding work-related cadence. When faced with a breakdown in temporal rhythm and situated coworker familiarity, participants described gauging the potential for work-related interaction

FIGURE 2
A Cadence-based Model of Virtual Multiplex Relationships



[a] Bold and italics signal the most crucial category of assessment or activity for the given cadence type.
[b] This only occurs when no work interdependence exists.

patterns to converge on both of these dimensions. They described two temporal rhythm assessments: (1) accessibility—Are you available to help and will you respond?; and (2) skill relevance—When, if at all, should I go to you with work-related issues? Table 1 presents additional examples of these assessments.

Given that our informants and their colleagues could work anytime, from anywhere, understanding the potential for convergence of their temporal rhythms of interaction with a colleague's was particularly crucial to the formation of work-related cadence. For instance, when describing particular individuals with whom she had developed strong work-related cadence, experienced hire Alena noted that certain individuals stood out for their accessibility—"I just need simple questions answered, and so they're always available, and they're always willing to assist anybody, and it doesn't even have to be on their team." She contrasted these individuals with those whom she had not developed a work-related cadence—"I don't find a lot of CEs [Customer Engineers] who are willing to help—I mean, most of them are willing to help, they just are very busy, and [if] they're not online, I can't chat [with] them." Accessibility, however, hinged on more than just being available; it also meant being responsive, a criterion amplified when working virtually. In his second interview, role transitioner Amit depicted this difference:

> So he sent an e-mail in the evening right around 7:00 or what not. What happened was I was actually on the road getting home from the customer's site. I didn't see it because I didn't want to read while I'm driving. So he's like, "Okay, that's odd, he usually responds; let's call him." He called, and I didn't respond because [my phone is] on silent. He texted me and it vibrated, but I'm not looking because I'm driving.

Amit described the implication this had for his colleague: "He felt like he was ignored a little bit and said, 'don't you do that again.'"

Beyond accessibility, informants noted the importance of skill relevance, or an understanding of *when*, if at all, to interact with virtual coworkers based on what they do:

> Once you understand their capabilities it's a lot easier for you to pick up the phone and say, "Here's an issue, I think you're the best person for it" or, "Hey, can I get your opinion on this?" or, "Hey have you seen this before?" (Ray; NH1)

TABLE 1
Understanding and Cultivating Work- and Friendship-Related Cadence

Understanding Work-Related Cadence

Type of assessment	Assessment dimension	Illustrative quotes
Temporal	Accessibility: Are you available to help and will you respond?	Yeah, I think they [relationships] develop really well because, at least for me, being kind of new to the team, I reach out to a lot of the people a lot like for help. I am supposed to have like specific mentors and things like that but I typically just reach out to whoever's available. (Steven; NH2)
		And those people [who sit in India], when I reach out to them to make a request, they usually are very responsive, and they stay on top of it until something's done. So I have got an appreciation for those people and what they do and the time sensitivity that they have. So yes, I have established a few relationships because of that. (Amit; RT3)
	Skill relevance: When, if at all, should I go to you with work-related issues?	[When describing someone on his team with whom he has cultivated work-related cadence] I do ask her a lot of questions and, in fact, a lot of people have gone to her because she has a deep knowledge of all the tools and processes. She's not very technical. . . so she's made up for it by becoming sort of the go-to person about how do you do this or that. (David; NH2)
		[In response to, "how would you describe your relationships with your coworkers?"] I would say they're very good. I understand what their skill sets are and where their strengths are at, and I think vice versa. (Cooper; NH1)
Relational particulars	Rapport: Do we work well together?	[On developing a good working relationship with a coworker] I had heard him on a conference call and everyone was screaming and yelling and panicking. He was the only one in the room who was cool, calm, and collected. . . so I requested that he be my technical account manager. (Bill; EH)
		[On barriers to forming strong relationships at Cloudly] If those individuals themselves are such where they don't want. . . to interact with you, then no matter what you do you're not going to be able to establish some sort of rapport, some sort of bond with them. (Akshay; NH3)
	Instrumentality: How might establishing work-related cadence with you benefit me?	If you were to promise me something and then you missed the deadline and you promised me again and you missed the deadline, well, I'm probably not gonna try to foster that relationship unless I really, really, absolutely need to. (Will; EH)
		It doesn't matter how good of a personality you have. At the end of the day, that work relationship is primarily driven by a business objective first. (Adit; NH2)

Cultivating Work-related Cadence

Type of activity	Specific activity	Illustrative quotes
Temporal	Regular, scheduled interaction	And it [contact] has to be somewhat consistent, especially if you're trying to form a relationship, there has to be some level of consistency there. And the more you're involved with someone, the more these things can evolve. (Bradley; EH)
		[A newly hired manager working to set up work-related cadence with his team members] One of the things I have done is I have set up one-on-one meetings. I've also set up like, a regular rhythm of the business meetings on an auto-link basis to keep connected with my team. (Adit; NH1)
	Communication medium choice	So I'm big on texting for things that need a quick response. Because all of us are virtual, and all of us are in customer-facing roles, sometimes we are in meetings, either with other internal teams from different parts of Cloudly or we are in front of the customer. So texting sometimes really works. You're in a meeting, you can't really pick up the phone and talk, you send a quick text to get a quick piece of information back and forth. And then you call back when you're in the car driving back home, driving back to your hotel, whatever. So texting works really great. You know, we use IM [instant messenger] quite a bit. IM and Skype. We use Webex a lot. For the larger group meetings, we will use Webex to collaborate and, you know, share information. Even sometimes when you're collaborating with just one other person and you're creating, maybe copresenting somewhere down the line, and you're creating collateral for it, we tend to kind of get on Skype or Webex to kind of work together on a piece of deliverable. (Neha; EH)

TABLE 1
(Continued)

Type of activity	Specific activity	Illustrative quotes
		I would say 90% of our communication is via e-mail. We also do instant messaging. We've got an internal instant messenger that everyone's connected on, so if we need a quick answer or we just need to communicate with an engineer quickly, we'll use the instant messenger. Otherwise, we'll e-mail then, and kind of as a last resort, very rarely, we'll pick up the phone and call the engineer. (Victor; EH)
Relational particulars	Interacting face-to-face	You know it's kind of interesting, because now I'm supporting account teams across the division. I always felt the need to connect with the teams I was supporting. Others don't work in that same mindset. I would schedule days in cities and say, "Hey, I'm coming up to Cleveland, and I'm going to spend three days up there," so then I would be. . . in the office even if they didn't need me. I would go there so that I would just—they would get to know me and see me and then they would start to leverage me in their accounts. So I would develop that relationship with the team because I had contact with them. (Gerald; EH)
		I would say any together-in-the-room sort of thing [helps you get to know your coworkers]. After that, the virtual relationship actually all works out. I consider many of my teammates—people that I've worked with [remotely] over the years—friends, and I'm still in touch with some of them who have gone on to other companies, even though they're on the other side of the country. You totally get real friendship and teamwork out of it. I'm just saying there's an ice-breaker-y kind of thing that has to happen—you have to meet in person before it can ever really gel. There's no magic "just have a phone call and now we're buddies." (Logan; EH)
	Imagining coworkers	It's funny, when you talk to someone you hear a voice, and that does tend to create a picture and then when you meet them it's like—"Really? You're him?" (Larry; RT1)
		I think like most people you obviously can distinguish from a name or voice, whether it's male or female. Then after that there may or may not be characteristics that you can derive from their name. If it's a Middle Eastern name, you probably have a pretty good idea and you hear, you know, what they're going to look like. If it's Joe Smith, you don't know what you're getting yourself into. (Richard; NH1)
	Self-disclosing	So if there's some question like about work, they'll be very involved, and they'll be very passionate about it, very interested in responding. But when you start leaning toward the personal side of it, the answers start coming very short, very pointed. You get cues from that to how far you can go and what kind of relationship that would be. (Amit; RT3)
		A lot of people don't put their personality in e-mails. And a lot of people don't put their personality in chat. A lot of remote support people I talk to, they were just basically like a robot almost. (Wayne; EH)
	Seeking information from alternative sources	One habit I've picked up over the past few years is—whenever I'm dealing with someone, especially in a large company like this of 70,000 people—it's not uncommon to work with someone I've never dealt with before. I go through the org. chart and pull out that person's picture. It helps me when I'm talking to them to be looking at a picture. It gives me insight for whatever reason. (Dinesh; EH)
		When you find the e-mail and they don't have a picture on there, you have to like go through the portal to find them. (Belinda; EH)
Understanding friendship-related cadence		
Type of assessment	**Assessment dimension**	**Illustrative quotes**
Temporal	Availability: Do you have time to be friends?	It becomes evident I think really quickly. There are a lot of instances where I've reached out in a friendly manner, and you really don't hear a whole lot. Those that tend to [respond] I guess have more the mindset that I do that there's importance in that [being friendly], [and] will reach back usually fairly quickly [to] at least establish that relationship. (Cooper; NH3)
		[On why virtual colleagues are harder to form friendships with] The travel piece of it creates a hindrance of their ability to really form solid relationships. . . I think relationships come just over time; just spending time together. And if they don't have the availability to do that then it's difficult to establish relationships with them. (Frank; NH4)

TABLE 1
(Continued)

Type of assessment	Assessment dimension	Illustrative quotes
Relational particulars	Desire: Do you want a multiplex relationship?	[A manager commenting on friendships between members of her virtual team] There are ones who are very cooperative, very helpful, probably very social. Whereas there are others that are probably more, "Hey I just want to do it myself, I'll try to do it myself." They tend to be a little bit more isolated from the friendship perspective. (Ben; EH)
		And then we would get started out with maybe just a little super-formal e-mail, and then they just became less formal, and a little more kidding-around, and just kind of a general, little step-by-step—how you build friendships with people. (Stefanie; EH)
	Chemistry: Do we "click" virtually?	You're kind of looking for a like-minded individual. . . In my case, do they have a good sense of humor, can they take a joke—that kind of thing, similar interests such as sports or politics or whatever. (Richard; NH2)
		We were both wired in the same way. We were both outgoing but also introverted at the same time. There was a lot—it was just a personality click, our personalities clicked. We worked really well together from a sales campaign standpoint, so we were friends that happened to work together. (Luis; RT1)
	Trust: Can I confide in you?	[In response to "How does the work itself impact relationship development?"] That [working together] kind of helps build a relationship too because we can both help each other and bounce ideas off of each other. That certainly builds a level of trust as well so I think that helps grow relationships too. Actually, it's more of like, "Hey, I trust you not to, like, call me an idiot because I don't know something. I think that fosters friendship as well." (Steven; NH2)
		[In response to "Can you tell me the story of that friendship?"] Being able to talk to each other and say, "I think this and I think that," even if just venting, I guess. And being able to trust that even if you say this and you don't really mean it, she's not going to go repeat it or I'm not going to go repeat it; we just need to vent. You know how sometimes you bitch about stuff and things come out of your mouth that you don't really mean but it's just because you're—I'm like that anyway, I get jumbled up and shit comes out and I'm like, "Ew, I didn't mean it like that, that sounded bad." And I consider her a friend because I can trust that she won't go and repeat it or take it out of context. (Denise; EH)
	Instrumentality: How might being your friend benefit me?	Success builds friendship. If you are doing everything right, and you're not getting much success, that relationship is not going to last very long because at the end of the day you are all getting paid to do a job. (Adit; NH1)
		If we are here to be successful and success is driven by a number of different things, not just money but advancement and personal satisfaction, and I think that you gravitate toward those that are going to help you achieve that. And you could be really nice, but if you are not valuable then you will eventually fall off. . . you're going to spend time with somebody who [you subconsciously know is] going to help you. (Carlos; RT3)
		Cultivating Friendship-Related Cadence
Type of activity	**Specific activity**	**Illustrative quotes**
Temporal	Interacting spontaneously (i.e., lack of temporal rhythm)	So we do things like where you hear a joke, or if we get some news—Internet news—that we think is hilarious, we'll text each other. (Malika; RT1)
		And it's like we've never been apart. And I consider the relationship with [Bob] to be the same way. Meaning I will go months, quarters, or even part of a year without talking to him. And then something will happen and we'll cross paths and it's just like we've never been apart. (Ben; EH)
Relational particulars	Relational expanding	I think you got to get to know them personally as well as professionally, and that's important. So I don't want to just talk with them about technology. I want to know how their daughter did at their choir event over the weekend. And you've got to kind of get to know them on a personal level as well because that helps build rapport and builds trust pretty quickly and then the professional stuff can just follow. . . I mean you ask, you laugh, you use humor, and I use humor a lot to try and get people to feel comfortable. It doesn't all have to be that professional. Because that stuff always happens anyway, right? (Isabella; EH)
		I reach out because I have a question and an individual is a specialist in the area. So, I will reach out and say, "Hey, how are you, I've got this question from a customer, and by the way, how are things?" I am asking a business question but also at the personal level. (Diego; RT2)

> "Who do you talk to in my role, like professional services?" Or "Who's the operations guy I need to talk to?" So you know you start identifying who those people are... You still go to the wrong person sometimes, and they say, "Well, no, you gotta go talk to that guy over there." (Richard; NH2)

The interrelatedness of accessibility and skill relevance—and their impact on the formation of work-related cadence—is perhaps best illustrated by new hire Jacob who, in his first interview, found it hard to establish a temporal rhythm of work-related interaction with his coworkers. He described how his coworkers did not understand the relevance of his work, impeding their desire to interact with him: "I'll be candid, it's working in this position and working in a role where you have to develop relationships [that] can be challenging... My role is not very high on the pecking order when it comes to priorities, which is a little disappointing." By time 3, Jacob noted that this lack of temporal rhythm hindered any sort of work-related cadence with many of his colleagues:

> I would say probably the most difficult communication situations are when I've tried multiple times to get ahold of somebody to help me. An example I'll use is a rep that I have up in Wisconsin... It seems like whenever I'm trying to get ahold of him to get answers and to progress things on my side, it's dead air, it's silence.

Perceiving a coworker as accessible and exhibiting relevant competencies appeared sufficient for Cloudly members to construct at least a minimal work-related cadence, one described as borne out of work-related requirements (i.e., interacting only when required):

> I've had people that I've worked with that I didn't like. But I had to work with them... We have a business to run, and I'll do that, but personally there was something I didn't like. And once I validated that, I kept them at arm's length. Now, with that said, I had to go to meetings with some of these people and there was no choice to that. (Ray; NH1)

However, as just implied by informant Ray, cultivating a robust work-related cadence necessitated more than just temporal rhythm; it also meant establishing a "collegial" work-related cadence. Importantly, though, when working virtually, individuals have a greater ability to choose with whom they interact at any given time (apart from scheduled team meetings). Informants thus described how they often coupled attempts to understand *when* interaction might occur with attempts to understand *how* the nature of the relationship with the given coworker (what we call "relational particulars") might influence patterns of interaction. They described two specific evaluations of relational particulars: (1) rapport—Do we work well together? and (2) instrumentality—How might establishing work-related cadence with you benefit me?

Cloudly members sought others with whom they had work-related *rapport*. In evaluating rapport, individuals asked themselves, "Do I like working with this person?" beyond their competence (Casciaro & Lobo, 2008):

> Just some people, over the phone or remotely, you can communicate; you're on the same page... or others you don't. It's like, "I like working with this person" or "I don't like working with this person." It's just like a feeling you can get. (Terry; EH)

In his second interview, new hire Steven described rapport as the differentiating factor between his relationships with a robust sense of work-related cadence and those with impoverished ones. He also described the overlaying of a friendship-related cadence (which we explore later):

> You've got coworkers that you kind of just work with because you're obligated to and you have the same goals, right? Then you have [those] where you actually enjoy working with them and talk with them more often or frequently. Then probably like good friends where you will actually try to contact them outside of work, maybe on weekends or something like that.

Apart from rapport, informants described how cultivating work-related cadence often hinged on assessments of the other's work-related performance. Via this final work-related assessment, *instrumentality*, individuals gauged how establishing a work-related cadence with a given colleague could benefit them. Those seen as good performers were (not surprisingly) more attractive coworkers with whom to establish work-related cadence—"Once they think that you're valuable and productive then you get to that second level where they start inviting you to things" (Malika; RT1). In his second interview, new hire Adit described why certain coworker relationships flourish at Cloudly:

> The bottom line, if you're successful, people will respect you, and I think the relationship blossoms. If they think you're an idiot then obviously it doesn't matter how charitable you are or how nice you are, how funny you are.

At the end of the day, when assessments of work-related cadence were promising, individuals attempted specific activities to cultivate work-related cadence (described next). When not promising, our informants noted a lack of motivation to cultivate any sort of cadence:

> Let's say the India PM [project manager] will forget to provide the workbook or something or tell the customer that... I'm always onsite till afternoon and the customer will be expecting me in the morning and get really mad. It's just kind of frustrating. I normally have a list of people that I'm like, "Let's see, don't volunteer for this project unless I absolutely have to." (Wayne; EH)

Understanding work-related cadence. When the potential for work-related cadence was assessed favorably, informants described actions to help facilitate that cadence: "You kind of have to make an effort at having regular cadence, making sure that you're exchanging and communicating as required" (Neha; EH), including: (1) regular, scheduled interaction, and (2) using certain communication media. Table 1 presents additional examples.

The first of these activities, regular, scheduled interaction, was especially critical. Scheduled interactions could be manager-initiated, such as a weekly or monthly call: "My particular team has a team call every Friday, and I think most teams do. Just to talk over things that are going on workwise" (Keith; EH). Alternatively, they could be more informal, as noted by experienced hire Alena, who spoke of a colleague in a different state: "she actually set up a kind of a weekly meeting with me just to talk on Fridays. I think partially just to make sure that I'm doing okay or whatever." Informants articulated specific strategies to guarantee this regular interaction, such as syncing calendars: "I literally just... make sure that everyone's calendar is up to date" (Lauren; EH), or scheduling meetings: "I am having to reach out and schedule time with those individuals" (Adrian; RT1).

Informants also expressed the importance of using certain communication media to ensure convergent temporal patterns of work-related interaction:

> I like instant messaging because you can ask quick questions and get quick answers back and forth, and they can do the same. And if it's going on too much, you can just pick up the phone, you know what I mean? Because you can only [use instant messaging] so much. (Denise; EH)

Interestingly, they noted how appropriate communication media have shifted over time, both within Cloudly and beyond:

> But my method has changed from calling to texting in the last five years, almost all the time, something like, "Hey, are you available to talk?" Or, "When are you available to talk?"... because people don't pick up their phones as much as they used to. (Gary; NH1)

Calling for a work-related reason without first contacting that colleague via another medium was so counternormative at Cloudly that experienced hire Terry noted that when he picked up the phone to call a coworker, "it freaks people out because everyone else texts and that's it."

Although establishing a temporal rhythm was essential, as noted above, it alone was not enough to create collegial work-related cadence; informants also engaged in activities to cultivate relational particulars that might influence patterns of interaction via: (1) interacting face-to-face, (2) imagining coworkers, (3) self-disclosing, and (4) seeking information from alternative sources.

First, face-to-face contact was, not surprisingly, frequently cited as the most efficient and effective way to cultivate relational particulars:

> You can get to know somebody as well as possible, and then it really starts over when you meet in person... sometimes all it takes is one meeting. So I've been on the phone five times... you spend some time with them at a [sales] kickoff or something like that and then the [next] time you talk on the phone, now you're like, "this is my buddy." (Carlos; RT3)

However, because many rarely had the opportunity to meet in person, they could not rely on in-person interaction. As one senior manager stated during an annual sales meeting, "We don't get together with everyone very often; it's once a year, and damn it, I'm gonna take advantage of this" (observation notes). As noted above, we found that members of Cloudly rarely, if ever, used videoconferencing. Cultivating work-related cadence thus involved efforts to "fill in the gaps" of relational particulars, unintentionally through imagination or intentionally through self-disclosure and alternative sources of information.

Thus, the second activity that informants frequently described, imagining coworkers, particularly occurred when they had never met in person. Conjuring images provided them with "a sese in your mind to what they may look like or how they may act" (Lauren; EH), engendering more human-like interaction—"You have a mental image and you think you know what they are... I'm a visual person" (David; NH1)—when engaging with coworkers. This

often unintentional imagery helped them make sense of the other and decreased the uncertainty arising from a lack of situated coworker familiarity. For example, one informant noted with respect to a coworker, "I picture a guy probably around six-foot tall, slender, brown hair, probably wearing a long-sleeved jean shirt and jeans" (Cooper; NH1). When probed on why, he responded: "I would say voice, just voice demeanor based on where he was out of North Carolina."

The images often seemed to derive from the prototypical identity that a nonvisual cue made salient. As in the above example, a colleague's voice often stimulated mental images:

> I thought he was a lot older than he actually was because he had this voice; if you talk to him on the phone he had a really deep, raspy voice. It was kind of like—I call it the "seasoned voice." (Will; EH)

Interestingly, these images did not always capture reality:

> What is really funny, though, and it completely knocked me off was this other guy who's another good friend of mine; he's Indian. . . we brought him to the States. He shows up and he says "Hi, I'm Ben." And I said, "No, you can't be Ben." He said, "What do you mean?" And I said, "Well, I'm looking for an Indian." And he goes, "I am. What are you talking about?" He looked like he was Chinese. And he's like, "Well you do realize India is this big, right?. . . Well I'm from over here," and it bordered China. (Jose; NH1)

And while some informants, such as the individual who had pictured a much older colleague based on voice, asserted that the difference in perception versus reality did not change how they saw the person—"So when I met him in person, I was a little shocked that he was as young as he was. But, again, it didn't change anything for me. It just was like, 'Oh, that wasn't what I was expecting'" (Will; EH)—others admitted that their understandings shifted:

> It really opened my eyes. I didn't think that I had any kind of biases or any kind of whatever before; but it really said, "Hey, you need to just keep a complete open mind and not expect anything." (Edward; NH1)

Without at least a perfunctory visual understanding of a colleague, the development of work-related cadence was more difficult to form. However, while these images clearly served a purpose, imagining, as alluded to in the above quotes, also paved the path for implicit biases.

Third, informants also depicted how they and their coworkers self-disclosed relational particulars to help establish rapport and assert their usefulness. Sometimes these disclosures emerged spontaneously—"just talking with a person on a day-to-day basis, you usually get bored just talking about work so you'll start asking about other things" (Nick; NH3). Often, though, informants described such efforts as more premeditated. For example, one new hire recounted how other individuals proactively reached out to welcome him and signal that they were available: "In the first day or two, probably half of the other SAMs [Senior Account Managers] sent me a short little one or two sentence e-mail saying, 'welcome,' you know, 'if you have any questions, give me a call' kind of thing" (Aaron; NH1). Disclosures were especially important for grasping who their coworker was because such information was often difficult to glean from virtual interactions: "some people have actually loaded their picture so that when they come up on Skype [messenger] a picture comes across" (Larry; RT1). Unlike in imagining, by selectively revealing aspects of themselves, individuals could better regulate coworkers' perceptions of them, such as Cooper, who noted that he made a "more conscious effort to introduce myself":

> I reach out [to my virtual coworkers] kind of informally through more of an informal e-mail with a quick bio. "Hey, here's who I am, here's where I'm located, this is kind of what I do." (Cooper; NH3)

Finally, Cloudly members spoke often of seeking information from alternative sources for clues on relational particulars. For example, new hire Richard stated: "based on who I'm speaking with I may do a Google search or a LinkedIn search to see if there is a picture of the person that I'm talking to" (NH1). Informants also drew on others: "I go to my manager and say, 'this person such-and-such reports to such-and-such. Do you have a relationship with that person? What do you know about [him or her]?'" (Hunter; RT3)—or consulted organizational resources:

> I'll go to the org. chart or look somebody up on LinkedIn. I'll see what their background or history is to see what our common points are. See if we have networked friends, or maybe a previous job or company we have in common. Those are the things I do to try and get a sense of who that individual is. (Adrian; RT1)

The cumulative effect of work-related cadence assessments and activities, if successful, was a clear understanding of when interaction will unfold and

how the nature of the coworker relationship might impact patterns of work-related interaction:

> You kind of understand the type of person he is. He understands the type of person you are, and I think there's just a flow to that conversation once you get to know people better... that helps things as far as when you call to get things done. (Richard; NH2)

Further, as depicted in Figure 2, work-related cadence activities were reciprocally associated with understanding cadence. Actions often generated feedback that deepened (or challenged) initial evaluations. For example, experienced hire Isabella told a story of how she worked virtually with a coworker for more than a year, thinking he lived halfway across the country. One day, they realized they lived mere blocks from one another. Even though they still work virtually, it changed how they interact and view each other:

> Now that I have his personal cell phone number and now that he sees that I'm calling, he answers... Whereas before, he'd get back to me but it might be 36 hours. Now he's getting back to me in 12 minutes.

Beyond work-related cadence: Desire for multiplex cadence. Although work-related cadence appeared sufficient for accomplishing tasks, even collegial work-related cadence was relatively impoverished compared to multiplex cadence, which also included friendship-related cadence, such that the sum of the individual cadences was greater than their individual parts (cf. Kilduff & Tsai, 2003):

> You can pick up the phone and call them, not just to discuss a work situation, but also maybe seek advice on [your] career in general, or to discuss families. You know you trust each other, you are each other's support group or board of directors... or on each other's personal board, if you will. (Neha; EH)

Further, while developing a (collegial) work-related cadence was sufficient for some informants—"I kind of want that separation, I kind of like that separation" (Douglas; NH1), and "I don't see the job as a place to socialize" (Harold; NH1)—others craved more than collegiality; they craved friendship: "It's important—if we don't like the people we work with, and we don't make friends with the people we work with, we would not be happy with our work situation or our lives to a large extent" (Neha; EH). Given the nature of our data, we can only suggest characteristics of those who wanted to develop a friendship-related cadence with virtual coworkers. Perhaps the most obvious is the one alluded to above: one's desire to integrate work relationships with personal relationships (Rothbard, Phillips, & Dumas, 2005). However, this desire appeared to go beyond segmentation–integration preferences for our informants (Kurth, 1970). For example, many informants described how in-person others fulfilled their need to belong (Baumeister & Leary, 1995), minimizing the need for friendship with virtual coworkers. For some, this was their family: "I tend to be more focused on my family... And almost at the expense that I'm so focused on getting things done throughout the day that I don't take the time to socialize with people" (Ben; EH). For others, it was local Cloudly colleagues:

> If I really felt like I needed to fill the gap of maybe having a friendship [virtually] then I probably would. But I mean I feel like I have plenty of friends here so... maybe I just don't put a lot of energy into building that kind of friendship [virtually]. (Steven; NH2)

Desire for multiplex cadence also appeared in relation to one's expectation that a virtual coworker friendship was, indeed, a legitimate form of friendship:

> The friendship that I would have in my generation would be somebody you actually do stuff with: you play golf, or you have lunch, or you have... face-to-face interaction with them. I would say you could only do that if you actually are in the presence of, or in the area of where those people are. (David; NH1)

Although one might argue that age primarily drives these expectations, even younger Cloudly members sometimes remained skeptical of forming friendships with remote colleagues. Take, for example, Elijah, a new hire in his 30s with plenty of exposure to virtual technologies:

> So I think whatever remote relationships you make, with the exception of maybe seeing them at a company-sponsored event or conference from time to time, they're gonna stay remote. And you're gonna interact with that individual when you think that they can contribute to maybe a question you have or something of that sort. There isn't going to be a whole lot of friendly, personal discussions. You know what I mean? Those types of things happen face-to-face over a beer or whatever. (Elijah; NH2)

Finally, perceptions that forming multiplex relationships hampered efficiency—aligning with cues received from management—appeared to curb the desire for multiplexity:

> If you open up that communication with everybody and you are talking that much, communicating that much, then you don't have time to do your work. So there's a fine line there. (Noah; EH)

Informants who did not want multiplex cadence, and therefore avoided friendship-related cadence,

appeared to focus only on work-related cadence: "why... invest my time talking to someone and trying to build this relationship when I can never actually interact with them in person?" (Thomas; NH1). Those who did desire friendship-related cadence in addition to work-related cadence undertook an additional set of assessments and, often, activities.

Understanding friendship-related cadence. Unlike in a collocated office where colleagues may spontaneously interact, virtual workers must actively initiate contact with each other. Given that friendship-related cadence goes above what is required for a working relationship, those who desired friendship-related cadence spoke of a singular temporal-related assessment: availability—Do you have time to be friends? New hire Edward, for example, described a coworker who had reached out to him at time 1. By time 2, they were friends: "He was just a guy that seemed... a little more social and his schedule was available at the time... So the fact that he put it out there publicly, it's like okay... he must have meant it." In her third interview, role transitioner Malika also noted the importance of availability: "I mean this job gets really busy, and I think their jobs get really busy, then that just functions to pull you apart."

The personal, voluntary, and highly socioemotional nature of friendship-related cadence rendered friendship-related relational particulars more important than temporal rhythm when assessing the potential for converging friendship-related patterns of interaction. Our informants were particularly attuned to four signals of relational particular potential: (1) desire—Do you want to be virtual friends? (2) chemistry—Do we "click" virtually? (3) trust—Can I confide in you? and (4) instrumentality—How might establishing friendship-related cadence with you benefit me? As noted above, these factors largely align with those that facilitate non-virtual coworker friendships (Altman & Taylor, 1973; Pillemer & Rothbard, 2018; Sias, 2009).

In assessing desire, informants gauged a coworker's interest in being friends with them:

> I have quite a few CEs where they're just personal, and they tell you things about what is going on in their life...And I have CEs who it's just all about work, like, "Hey, can you do this? Okay. Thanks." That's it. (Alena; EH)
>
> I interject a lot of humor in any interaction I have, whether it's virtual or in person, just because the nature of life is sometimes just crappy... You can tell [if they're friendly] by how they respond to your humor. (Paul; NH3)

This appeared to go hand in hand with gauging chemistry, as informants described "clicking" with certain virtual others: "So my sales rep, first of all, is an awesome guy. He is a very friendly people person. So we've became very—I want to say—attached to each other... We just, what do you call it? Click?" (Diego; RT3); "Just over time, right, when you start working together and you can quickly see if there's like a chemistry... You click with some people at work and the friendship grows and [with] other people you don't" (Terry; EH).

Informants also noted the importance of converging patterns of trust in friendship-related cadence: "you talk about personal things, and little by little you test the friendship. You have to share with them some personal stuff, and you realize they will keep it personal" (Dinesh; EH); "She's reached out to me a couple times and I reach out to her about some other personal stuff. Like I had a death in the family earlier this year...I think it just comes down to who a person is" (Denise; EH).

Interestingly, while a friendship relationship is typically seen as its own reward (Clark & Mills, 1979), many of our informants appeared to take more of an instrumental approach to virtual coworker friendship. This is perhaps because it takes extra effort to cultivate friendship-related cadence virtually (and is typically piggy-backed on work-related cadence, with its own assessments of instrumentality), as noted by experienced hire Nathan:

> It took effort to make sure that I knew who I was talking to and I remembered exactly what they were into, what they did, what they liked, what they didn't like, how many kids they had if they had kids, if they were married, those types of things. I had to make a more concerted effort of remembering those things as opposed to it just naturally flows when you see the same people every day.

Cloudly members articulated the importance of converging perceptions of work-related benefit when evaluating friendship-related cadence potential:

> So being consistent and good at your job makes people want to be your friend at Cloudly ... because you're actually somebody valuable that they want to maintain. Then, you know, once that is established, they don't think you're a complete waste of time" (Malika; RT1).

Experienced hire Logan painted the following 2×2 image:

> So imagine that there's a foursquare box in front of you, and along one axis you have a person's

> friendliness, and on the other you have the person's utility... Where I really, really like people is when they're in the upper right quadrant. Those are the people who are both friendly—nice people that you wanna be around—and people who are useful.

In total, when these friendship-related cadence assessments were positive, individuals engaged in activities to cultivate friendship-related cadence; we turn to these next. Conversely, when negative, they focused only on work-related cadence:

> I even think, ah, you know, I've got to work with this person. I definitely want to keep that relationship at a professional level and not necessarily move more towards a friendship... it can kind of become evident very early on that, "Hey, this is somebody that at a professional level there won't be any awkwardness, we'll work fine." But that's as far as this relationship's going to go. (Cooper; NH3)

Cultivating friendship-related cadence. Ironically, while a strong temporal rhythm was paramount to work-related cadence, a lack of temporal rhythm—which often took the form of spontaneous yet meaningful interactions—seemed to define friendship-related cadence. For example, one informant described the "fast friendships" he had forged with virtual coworkers:

> And when that happens, then communication is natural. I don't hesitate to pick up the phone and talk to someone or text someone... there's no loss of intimacy by that kind of method of communication. (Mohan; EH)

With temporal rhythm taking a back seat, informants articulated the significance of relational particulars to friendship-related cadence: "I think our relationship is defined by the trust we share and the fact that we are in touch, whether it's by phone or e-mail, whatever. I don't feel distanced from her because of the nature of our relationship." As a result, intentional efforts aimed at cultivating convergent patterns of interaction that transcended work—"relational expanding"—emerged as crucial to friendship-related cadence—"it can be difficult to establish that sense of personal relationship because everything is, to be honest, it's very impersonal" (Jacob; NH1). Relational expanding, defined as broadening the horizons of the relationship beyond work (cf. Xu, Lewandowski, & Aron, 2016), helped break through the formality imposed by virtuality and establish chemistry, trust, and instrumental benefits:

> Yeah, there's a few [people I have gotten to know better] and it's because you may have had a phone conversation with them which has gotten off of strictly work and gone into something maybe a little bit more personal. (Larry; RT1)

Relational expanding proved important because, when working virtually, informants could not rely on the natural expansion of relationships; they had to proactively develop them, such as through questions:

> You just start, you know, asking more questions: "Where are you from? Where did you go to school?" You know, "You're married, what's your husband do?" Eventually, you know, it's like something that is very comfortable. Like, you feel like you know the person, just through a completely virtual working relationship. (Terry; EH)

Certain social media also served as a natural context for relational expanding (Ollier-Malaterre et al., 2013). For example, while LinkedIn was described primarily as a platform for connecting professionally, other sites, such as Facebook and Instagram, were reserved for those with whom the relationship went beyond the largely work-related sphere:

> Everyone's on LinkedIn, everyone's my friend on LinkedIn. That is my professional network in my opinion, and Facebook is my personal life. But I am friends with some of the people from here that I've gotten closer to... if they friend me, I don't always accept it, just based off of the relationship I have with them. I guess because I'm sharing everything about my most private life. (Elena; EH)

These more private social media sites allowed Cloudly members to learn personal information about virtual coworkers, as Elena continued: "Facebook friends, it's kinda like, 'oh, I saw you went out with your team and did this. Oh, now I know what so-and-so looks like.'" Finally, informants spoke of expanding the relationship by expressing emotions that transcended the "feeling rules" (Hochschild, 1979) of the work relationship: "So I think it's just—we have enough shared emotion for lack of a better term... we've developed that bond that says, 'if I need something... I call [my friend]'" (Luis; RT2). That said, when emotions were inappropriate, they could be a red flag or deterrent to cultivating friendship-related cadence:

> That's really, for me, that's a big part. How do people react under pressure and if it makes it a little bit negative, I cut off...I've seen people get angry. Do they get agitated?... Those people, I keep at arm's length. (Gary; NH3)

Analogous to work-related cadence assessments and activities, the cumulative effect of friendship-related cadence assessments and activities, if successful,

was a valued friendship-related cadence that potentially facilitated the same benefits of collocated coworker friends:

> Friendships that are virtual? In essence, it isn't really much different... As long as you talk and you keep in touch and have that conversation going back and forth, I guess it isn't really that much different. (Keith; EH)

Further, as in work-related cadence, friendship-related cadence activities were reciprocally associated with friendship-related cadence assessments as behaviors generated feedback that tended to add nuance to the very evaluations that initially induced Cloudly members to invest in cultivating friendship-related cadence. Experienced hire Stefanie exemplified this when discussing the trajectory of one of her virtual coworker friendships:

> So I started reaching out to this CE and saying, "I don't even know what this means, what am I supposed to do with this?" And he was just so nice, and he would just briefly explain it... and he was just very supportive in that way... [Then] things would happen. For instance, he was sick for a week or so, and I would send an e-mail about that, just saying, "I heard you're not feeling well; hope you get better soon."... Same thing for him, things would happen to me... just a concern for each other has developed.

The Role of Context: Managerial Stage Setting

To this point, our model assumes that all of our informants equally experienced the Cloudly organizational context as supportive of their efforts to understand and cultivate relational cadence. However, managers play a particularly crucial role in "setting the stage"—or not—for virtual employees to establish both work- and friendship-related cadence, as they tend to be one of the few regular and personal touchpoints to the organization per se:

> As a manager or as a director, as someone responsible for resources, you can certainly do things to establish activities or communications... whether it's formal or something informal to facilitate the interaction. (Akshay; NH3)

Managerial stage-setting was important for facilitating friendship-related cadence on top of work-related cadence (thus enabling multiplex cadence), especially given the high level of autonomy that virtual workers tend to have and the implicit cues that Cloudly members received (e.g., perceptions of formality and the sense of being "watched"). For example, new hire Edward, who had reached out to one person in particular but was still struggling to understand how and when to interact with coworkers, noted the consequence of an explicit absence of managerial stage-setting (and the noticeable drive for efficiency) on team calls during his third interview: "[Our team meetings are] just a very quick, 'update me on your accounts' so that [we] know what's going on. There's no banter, there's no, you know, 'Hey, how you doing?' whatever." On the flip side, other managers took explicit steps to try to foster more personalized relationships. For example, experienced hire and manager, Denise, described how she instituted a "Friday song of the day" where one person sends out a song to the whole team based on how they are feeling that day. She said, "I think it kind of just gets people talking a little bit more on a personal level, like finding out other things rather than just the business side." Megan, an experienced hire, also noted the stage-setting efforts of her manager:

> I think the coolest thing, the simplest thing anyone can do, is [our manager] asked us all for a picture of ourselves, because we talk to these people all the time, but we're like, "What do they look like? I don't even know, I'm just guessing."

While not necessarily a deal breaker (especially since virtual workers typically have leeway in who they interact with and when), the absence of managerial stage-setting appeared to stunt individuals' efforts to establish friendship-related cadence: "I think that part of the challenge here [in making friends] is my boss is so new...He is still kind of trying to find his way. He doesn't know sometimes how to help me" (Ashley; NH1).

When does Friendship-Related Cadence Represent an "Actual Friendship?"

If friendship-related cadence is a necessary precursor to virtual coworker friendship (and a multiplex relationship), when does it become representative of virtual coworker friendship? A heuristic used by informants to identify this passage was whether convergent patterns of personal interaction between oneself and a particular coworker were strong enough to transcend work interdependence, such that the friendship aspect of multiplex cadence was seemingly robust enough to stand on its own:

> Friendship per se in my mind is something different from good working relationships ... Coworker friendship is when you have something in common

> outside of work and when you start finding things in common outside of building systems. (Harold; NH1)
> I have had friends that have kind of transcended that [project-only relationship] and people that I would say still to this day, that if I tend to be in his area, or he's in my area, that we'll try to still catch up on a personal level in person and still talk at a regular interval over the phone. (Cooper; NH2)

However, without the interdependence that defines multiplexity, informants noted that maintaining virtual coworker friendships was harder. Role transitioners who suddenly lacked such interdependence felt this most acutely. For example, in her third interview, Malika discussed those with whom she had cultivated multiplex cadence in her previous role: "There's no reason [to keep in touch] and I literally don't have the capacity to maintain those relationships anymore."

Benefits of Multiplex Cadence

Given that work interdependence is often the seedbed for virtual coworker friendship (Sias et al., 2012; Yakubovich & Burg, 2019), multiplexity is typically synonymous with friendship-related cadence for virtual workers—"I mean, work is number one, and work is the reason why we have a relationship" (Frank; NH). Beyond our data, scholarship has established that coworker relationships that combine both work-related and friendship-related interactions are largely beneficial for both the work and friendship relationship. For example, Methot and colleagues (2016) found that friendship enhances job performance by facilitating trust and positive affect, providing individuals with greater coping resources. We contend that cadence works in much the same way. That is, the very establishment of one type of cadence informs and enhances the other, creating synergy that transcends any unitary cadence (cf. Ancona & Chang, 1996):

> When you have a friendship-based work relationship, I think individuals may be more apt to go out of their way to assist. Maybe they will do things more quickly. Maybe they will be more candid with you. I think there is just a much more true relationship and less of the formalities that you sometimes have with work relationships. (Adrian; RT2)

Tables 2a–c provide examples of virtual coworker multiplex cadence development, illustrating the interaction between work-related and friendship-related cadence development over time.

TABLE 2a
Virtual Coworker Multiplex Cadence Development (Ashley; New hire)

Time 1. At this time point, new hire Ashley discusses a particular Cloudly coworker with whom she sees herself becoming friendlier:

Basically we have interaction because we share customers. When I first started, he was calling into my customers. He was relatively new as well, but he was calling into my customers and calling at too high of a level. He was upsetting the people at the levels that he should have been calling at because he was calling their bosses. . . He didn't know. We had to kind of put together a no-call list, and we had to kind of work through [that]. Then slowly just getting to know each other and me going to him and saying virtually, "What did you do in your last job? What is your home life like?" [Understanding friendship-related cadence]

Then also setting up a cadence of "I need to see a report every two weeks of who you're calling and what you're planning on addressing with them." We're on a good playing field now in terms of like how we're working together. We do talk on the phone. I will call him once in a while and just, "Hey how are things going, are things going well for you?" [Cultivating friendship-related cadence]

I would. Yeah, for sure [consider him a friend]. Everyone else here, I'm still trying to form the friendships, it's been hard. I mean I won't lie. It's like the friendships will come, but I think first I have to get people to kind of, like, respect me for what my role is and what I'm doing. [Understanding work-related cadence]

Time 2. At this time point, Ashley discusses the current dynamics of this relationship and how friendship-related cadence continues to be maintained:

Yeah, I mean for sure [our friendship is at the same level]. And part of it is we share responsibilities in our jobs so it kind of goes along with our roles. But yeah, for sure, definitely forming good friendships—and I don't start out every phone call or every e-mail with, like, getting to the point of this. It's like we have our personal discussion first, like, "Hey, what did you do last weekend?" or, "I know your daughter was sick, how is she feeling?" or like we know what's going on in each other's lives. That adds a nice personal element to it. [Desire for friendship (a multiplex relationship); cultivating friendship-related cadence]

Time 3. At this time point, Ashley discusses how she has picked up additional assignments that do not involve the individual she described earlier. She also notes changes in her personal life that have reduced her desire for virtual coworker friendship. She suggests the waning of friendship-related cadence with that particular coworker:

There hasn't been an opportunity really for us to get on the phone and have a conversation. To have a social conversation with someone is probably last on my list of things. . . Given my situation with my family and everything that comes first; they're super busy, my boys. I [am] going in a lot of different directions and so, if I do have free time, I want to spend it with some of my out-of-work friends.

TABLE 2b
Virtual Coworker Multiplex Cadence Development (Larry; Role transitioner)

Time 1. This role transitioner talks about how, very early in his current role, he connected with someone who had previously held that role. In this example, the friendship-related cadence seamlessly integrated with the work-related cadence:

He's based in, I think, Detroit, and we got—we began talking primarily on Skype [messenger]. And we had escalations where we had common interests [Work-related cadence]. We worked together, and when I ended up calling this guy [to find] out more—deeper answers to the questions I had, I found out that he had been a SAM in the past. So we ended up having several very long conversations about my new role, the past role that I was leaving, his past. And then you end up having family discussions and talking about wives and children. So you end up with a deeper relationship. And when he reaches out to me on Skype, I enjoy the conversation because we have something more to share. [Multiplex cadence]

Time 3. Unlike in the new hire situation above, this friendship-related cadence had begun to transcend the work-related cadence. He talks about the friendship-related cadence activities (i.e., spontaneous interaction and relational expansion) that he anticipates occurring, even without a work-related reason for interacting:

I haven't talked to him in a couple of months. But that's not unusual. As a matter of fact, you mentioning him makes me think, "geez, I probably need to reach out". . . I'll see him on Skype and say, "Hey, how are you doing?" He may be underwater and kind of put a pin in it, and we'll talk later, or we'll end up on the phone for an hour. [Spontaneous interaction; friendship-related cadence]

However, while multiplexity might be the norm, our sample did include remote workers who established only friendship-related cadence without formal interdependence. This, as discussed, almost always occurred with previous in-person contact. We speculate that, in cases of nonsimultaneity, whichever cadence is first established likely has a stronger effect on the nature of the multiplex cadence than does the second. That is, if nonmultiplex virtual coworker friends were to become interdependent, the friendship-related cadence would strongly color the work-related cadence and vice versa.

DISCUSSION

Toward a Cadence-Based Theory of Virtual Coworker Multiplex Relationships

The cadence-based model of virtual coworker multiplexity that emerged from this study (Figure 2) highlights how virtuality changes the very nature of coworker friendship formation, such that perceiving convergent patterns of interaction—relational cadence—is a critical mechanism in establishing and growing a friendship. It emphasizes the importance of both temporal rhythm and relational particulars in developing this cadence, the intentionality necessary for cultivating a virtual coworker friendship, and the intertwined relationship that friendship-related cadence has with work-related cadence.

Building an Understanding of Cadence in Virtual Coworker Relationships

Our findings suggest that virtual workers often experience virtuality as a barrier to coworker friendships. The mechanisms underpinning the perception of this barrier map closely onto the challenges previously identified by scholars—communicating via technology strips colleagues of synchronous communication and the ability to convey rich social context information, ultimately inhibiting situated coworker familiarity (Hinds & Cramton, 2014; Short et al., 1976). However, our findings also

TABLE 2c
Virtual Coworker Multiplex Cadence Development (Angela; Experienced hire)

This informant describes friendship-related cadence with a virtual-only coworker she has known for two years (at the time of our conversation, she had never met this coworker in person):

There's a girl and she's in Massachusetts and we're Facebook friends and stuff. . . Once we process orders it goes to her team, and they have to do their checks and balances and stuff, so there's back and forth conversation regarding orders. And her and I just somehow started chatting and just she's funny, she had some funny quirk, and I'm like, "Oh yeah, okay, I get this." [Understanding and cultivating work-related cadence]

Some of the people in her team can be super nitpicky and that makes our job more difficult, and I'm sure we make their jobs difficult too. I'm sure it's back and forth. But she kinda understood where I was coming from and so since then we've kinda chatted back and forth and like, "Oh my God, can you believe this? Oh, this [person] did this." Kind of camaraderie and complaining about work. Yeah, so it was sort of that way and then [we became] Facebook friends. It's kinda like, "Oh, I saw you went out with your team and did this. Oh, now I know what so-and-so looks like.". . . [We talk] maybe once a week or so just to check up to see how we're doing. [Understanding and cultivating friendship-related cadence]

uncovered that virtual work may be experienced as more formal, efficiency-oriented, and traceable (cf. concern for working environment privacy [Ball, Daniel, & Stride, 2012]). This discovery highlights an implication of virtual work not previously articulated: it affects coworker relationships by more than just *what* and *how* employees convey information—it potentially transforms their understanding of the purpose of interactions when working.

The totality of these differences necessitates the intentional cultivating of a previously unidentified mechanism—relational cadence—for facilitating many of the relational processes that individuals in collocated organizations may take for granted. Indeed, given a perceived lack of potential for convergent interaction patterns, our informants made the often very conscious decision not to invest resources in a given coworker relationship. However, when the potential for such convergence existed, they engaged in the very behaviors that often cultivate strong work and friendship relationships, such as sharing emotions to build trust, asking questions to enhance self-disclosure, and connecting on social media sites to enhance perceived similarity and foster rapport.

Intertwining work- and friendship-related cadence. An important aspect of relational cadence that emerged is that employees establish distinct, but codependent, cadences (work- and friendship-related). When held simultaneously, as is often the case with virtual workers, the two cadences fuse to forge a multiplex cadence. To this point, scholars have largely discounted the presence and implications of the work-related relationship on friendship dynamics. As noted earlier, the literature has tended to focus on stage models in which organizational members move through predictable phases of relationship development (e.g., from "friend" to "close friend") (Boyd & Taylor, 1998; Ferris et al., 2009; Kram & Isabella, 1985; Sias & Cahill, 1998). Perhaps as a result, our current understanding of the coworker friendship formation process emphasizes the dynamics internal to the friendship relationship itself. It thus represents a somewhat closed-system view that generally decouples the work-related relational context from friendship. In contrast, our findings show the reciprocal impact that work- and friendship-related cadence have on each other.

One particularly intriguing way in which this manifested was in the prominence of competence (and, by extension, instrumentality) in friendship-related cadence. Previous work by Casciaro and Lobo (2008) found that, for task-related interaction, a coworker's competence is seemingly irrelevant if one experiences negative affect for the relationship. They suggested that people are more likely to engage liked but less competent coworkers than disliked but more competent coworkers. This implies that, for collocated employees, cadence may be predicated more on assessments of positive affect (what we call "rapport" or "chemistry"), while for virtual workers cadence may be predicated more on competence (i.e., skill relevance and instrumentality). We see this as an important question for future research to examine.

Relatedly, perhaps because friendship scholars have often decoupled the work and friendship relationships, they have spent a significant amount of time understanding how a work relationship might stress a friendship relationship, and vice versa (Methot et al., 2016; Pillemer & Rothbard, 2018). For example, scholars have typically cast instrumentality as particularly *undermining* of the friendship relationship, yet our informants noted it was an important *determinant* of friendship-related cadence assessments (Bridge & Baxter, 1992; Ingram & Zou, 2008). These findings suggest that, especially for the virtual workforce, the assumption of a contradiction is both limiting and contrary. Individuals in our sample experienced the work- and friendship-related cadences as so deeply intertwined that virtual work cadence was a facilitator, rather than a stressor, of the virtual friendship-related cadence (Ancona & Chang, 1996; Methot et al., 2016; Yakubovich & Burg, 2019). Such insights broaden the theoretical conversation on multiplexity in both virtual and, as we will later discuss, face-to-face coworker friendship.

The intentionality behind relational cadence in virtual work. In collocated relationships, research has suggested that as employees continue to interact, the breadth and depth of social connection naturally increases and a friendship may organically blossom (Altman & Taylor, 1973; Boyd & Taylor, 1998; Kram & Isabella, 1985). However, our findings highlight the implications of diminished opportunities for natural, emergent social connection that attend virtual work. In particular, our informants described a seemingly more intentional virtual coworker friendship formation process. When relating is asynchronous and largely mediated by technology, they could be more selective in *who* they interacted with, more deliberate in *when* they interacted, and more purposeful in *how* they interacted. In needing to establish cadence, they also illustrated a potentially more laborious friendship formation process relative

to in-person formation. This finding calls into question the ease with which friendship grows from a virtual work relationship. That said, we discuss below how our data collection method may have amplified some of these findings.

The effects of imagining in the cadence-cultivating process. Given this highly intentional cadence-cultivating process, the fact that the unconscious process of imagining played a role in our findings is particularly intriguing, especially since it proved to be a double-edged sword. On one hand, imagining allowed informants to infuse their virtual communications with much-needed social cues that set the stage for and contributed to self-disclosure, minimizing the barrier of virtuality and facilitating virtual coworker friendship development. This contrasts with previous research suggesting that employees' motivation to form an individuated impression of coworkers is reduced in a virtual context (Johri, 2012). On the other hand, our findings suggest that this need to understand a personalized other is so strong that individuals often formulate an entire imagined persona based on potentially dubious cues. In this way, using imagination is a previously unidentified way of lessening "situational invisibility"—the lack of situational knowledge of others that remote workers face (Cramton, Orvis, & Wilson, 2007). This suggests that models of coworker friendship should account for both imagined and "objective" characteristics of friendships. These imagined characteristics, however, may lead to biased ways of interacting, given that the person is essentially a figment of one's imagination.

For the most part, when imagining largely centered on superficial characteristics, such as height, age, or hair color, informants described no difference in how they interacted or worked with coworkers after meeting them in person. However, we suspect that when imagining aroused incorrect assumptions of more deeply rooted characteristics, such as the informant who wrongly assumed that a coworker from the part of India that bordered China would physically (and, we surmise, even behaviorally) appear Indian rather than Chinese, figments of imagination were less innocuous (perhaps especially in regard to friendship building). In short, while imagining may be helpful in lessening the uncertainty of the other individual (Kahneman & Tversky, 1974), it may prove harmful if such images do not align with reality.

Cultivating versus maintaining friendship-related cadence. In the friendship literature, there is an assumption that once a friendship is present it continues (cf. Bridge & Baxter, 1992; Sias & Gallagher, 2009; Sias et al., 2004). Our emergent theory shows that this is often not true in virtual coworker friendships, as maintaining friendship-related cadence without work interdependence proved challenging for our informants. Indeed, to the extent that interdependence facilitates friendship-related cadence (and, ultimately, multiplexity), a lack of interdependence challenges already established friendship-related cadence. Our findings thus suggest that the permanence of coworker friendships should not be a taken-for-granted assumption for virtual workers.

Relational cadence vis-à-vis social synchrony. Finally, our notion of relational cadence resonates with the existing concept of social synchrony, which refers to the momentary match—in terms of temporal alignment and coordination—between individuals' behavior (Leroy, Shipp, Blount, & Licht, 2015; McGrath & Kelley, 1986). High synchronicity occurs when people's actions move at the same rate and exactly together, while low synchronicity occurs when people's actions move at different rates and separately (Dennis, Fuller, & Valacich, 2008). Relational cadence contributes substantially to our understanding of synchrony. Most importantly, it includes one's sense of a mutual understanding of temporal rhythm that may or may not be synchronous in a given moment. It also speaks to the question of *how* individuals establish synchronicity. Preliminary research shows that individuals tend to "drift" into synchronicity, perhaps even more so when they desire to lessen social distance with another (Issartel, Marin, & Cadopi, 2007; Miles, Lumsden, Richardson, & Macrae, 2011). Work on entrainment has also suggested that individuals might spontaneously match their behaviors to those of others, or to broader temporal patterns in organizational life, such as deadlines and norms (Ancona & Chang, 1996; McGrath, 1991). However, our findings suggest that effective patterns of virtual interaction are inherently more complicated and intentional to facilitate versus non-virtual interactions; they include characteristics of the particular other and the content of interactions (Fisher, Pillemer, & Amabile, 2018; Hinds & Cramton, 2014; Maznevski & Chudoba, 2000).

Considerations of Transferability

To facilitate transferability, or the extent to which findings apply across contexts (Lincoln & Guba,

1985; Shah & Corley, 2006), we consider the unique characteristics of our sample.

Transferability of relational cadence to non-virtual coworker relationships. Although our model was inductively developed with the unique demands of virtual coworker relationships in mind, we believe that the articulated process of relational cadence is likely present and (as our editor noted) taken for granted in collocated coworker relationships. Indeed, scholars have increasingly recognized that all teams—even those that are collocated—may communicate extensively through electronic communication (Maynard, Mathieu, Gilson, Sanchez, & Dean, 2019). As a result, when applying our model to collocated samples, it is important to take into account the impact that various dimensions of virtuality can have (Gibson & Gibbs, 2006). For example, less geographic dispersion may mean that individuals need not rely on their imagination or social media sources as primary activities for understanding relational particulars. We see these issues as important for future research.

Considering Cloudly as the context. We collected data in the IT industry, a context known for its male dominance (more than a 7:3 ratio of men to women at the time of study [Bureau of Labor Statistics, 2016]). We know that friendship dynamics differ between the genders. Women tend to talk with friends—and talk about more intimate and personal issues—while men tend to engage in activities with friends (Fehr, 1996).[5] Women are also more likely than men to form more personal and intimate relationships online (McKenna, Green, & Gleason, 2002; Parks & Floyd, 1996). However, given the small number of women in our sample, we cannot meaningfully speak to the impact of such gender differences on cultivating relational cadence. The very fact that we found strong friendship-related cadence for both our male and female informants in a male-dominated organization and industry suggests that these dynamics might be even more apparent in a gender-balanced context, and we encourage future research on this.

While all informants in our sample worked virtually with their coworkers at least 50% of the time, and were part of globally dispersed teams, most were only a few hours' drive from their field office or other coworkers. It is likely that merely having the chance to meet in person influenced our findings. The transferability of our model to a virtual context in which face-to-face interaction is not at all possible is an important consideration for future research. Further, as mentioned above, our informants stated that videoconferencing was counternormative at Cloudly because they did not want to worry about their appearance and they spent a lot of time in their cars. This is a particularly interesting paradox given that informants described Cloudly as a company that generally valued coworker relationships, and video conferencing would seem the richest and most efficient way to facilitate such relationships (Short et al., 1976). How, then, might these dynamics differ in an organization that *does* readily employ such technology? We surmise that, similar to face-to-face contact, more regular use of video might render other activities that help establish a sense of situated coworker familiarity less important (e.g., looking at someone's Facebook profile). That said, each communication medium conveys slightly different information, such that each likely retains some importance.

Finally, we studied the sales and customer service divisions of Cloudly because our HR contacts deemed them "friendly." Based on interviews, we also determined that these divisions were performance-oriented. While we believe that our findings are transferable to other companies and industries, it is plausible that Cloudly members received particularly strong cues from their managers about virtual work as a mechanism for efficiency and effectiveness. It also might have heightened the coupling between work- and friendship-related cadence and the desire for coworker friends who provided instrumental benefit. However, the very fact that informants formed friendships despite the performance-oriented culture makes this somewhat of an "extreme exemplar" (Eisenhardt & Graebner, 2007: 27) in which to study the intricate yoking of the two relationships. It also likely contributed to our ability to notice this important—but largely unrecognized—piece of the friendship formation process.

Limitations and Future Research

It is important to consider the potential impact of limitations of our study design, as well as opportunities for future research sparked by our findings. First, by asking informants to retrospectively describe how they became friends with their virtual

[5] Our review team noted that there was a lack of warmth in how our informants described their relationships. We suspect that we would have seen more warmth in our data had our sample included more women or if we had broadened our sources of data (described below).

coworkers via interviews, our method of data collection may have influenced the deliberateness with which our informants explained how they formed virtual coworker friendships. That said, we do not believe this to be the case. In our initial interview protocol, we asked individuals to tell us the "story" of a given friendship—if they had one—without explicitly probing for specific assessments or actions. As it became obvious that our informants were very measured and deliberate in whom they befriended when working virtually, we began probing for what our informants desired in a coworker friend and how they actively cultivated that friendship. Additionally, our longitudinal sample featured Cloudly members making virtual coworker friends in real-time. We purposefully chose this design to minimize retrospective bias in the friendship formation process.

Second, our sample was limited to one friendship partner. While this allowed us to dig deeply into one partner's experience in cultivating a virtual coworker friendship, several important questions remain. For example, what happens when an individual wrongly perceives a colleague as closed to friendship-related cadence because they do not answer their phone, but the reality is that the norm of answering phone calls is becoming obsolete (Byron & Landis, 2020; Madrigal, 2018)? Future research might employ a design in which dyadic interactions are captured (e.g., transcripts of internal instant messaging conversations or e-mail chains) or both individuals are present for interviews or submit regular journal entries. Broadening the types of data collected may illuminate additional subtleties of the friendship formation process. One example is gender dynamics, as we might expect gender differences in self-disclosure via instant messages, social media, or e-mail (e.g., Special & Li-Barber, 2012).

Third, our informants experienced virtuality as a barrier to coworker friendship formation. Yet existing literature has hinted that, in some circumstances, the opposite may be true. For example, researchers have found that individuals may be more likely to self-disclose online versus in-person because anonymity is somewhat assumed (e.g., Bargh, McKenna, & Fitzsimons, 2002; Joinson, 2001; Weisband & Kiesler, 1996). Illustratively, John, Acquisti, and Loewenstein (2011) asked participants to state whether they had engaged in specific intrusive behaviors via a website that looked professional (lower disclosure danger), unprofessional (higher disclosure danger), or neutral. Unless privacy concerns were made salient, those in the unprofessional condition were *more* likely to divulge intrusive personal information even though they rated the site as less secure. The authors drew an analogy to "strangers on a plane," suggesting that individuals might be more willing to divulge personal information when they perceive they are less likely to again encounter the entity to which they have just disclosed. At Cloudly, of course, individuals *did* have ongoing work-related relationships and thus were neither anonymous nor engaging in simple one-off encounters. They also described working virtually at Cloudly as a relatively formal, efficiency-oriented, and traceable experience, further heightening the barrier of virtuality. Understanding how work organizations can minimize the barrier of virtuality beyond the identified tactics of managerial stage setting remains an important empirical question.

Finally, we also encourage scholars to extend our model to related research domains. For example, might the notion of relational cadence help us predict other types of interpersonal dynamics for remote workers, such as leader emergence (Yoo & Alavi, 2004)? It is plausible that those who cultivate and sustain relational cadence with remote colleagues are more likely seen as leaders. Or perhaps applying our model of relational cadence to socialization might help scholars better understand the process of newcomer adjustment for virtual workers (Ahuja & Galvin, 2003). One of our reviewers also wondered how working virtually changes the nature of "real-world" friendships and family relationships. We think this is an area ripe for future research as the boundaries between work and nonwork become ever more blurred when working virtually (Ollier-Malaterre et al., 2013). To be sure, our model suggests that working virtually intensified the importance of having in-person relationships outside of work for some, yet increased others' desire to cultivate friendship-related cadence with virtual colleagues.

CONCLUSION

Research has suggested that the more time individuals spend physically apart from coworkers, the more isolated they feel from others and their organization and the lower the quality of connections they have (Bartel, Wrzesniewski, & Wiesenfeld, 2012; Gajendran & Harrison, 2007; Moss, 2018). Feelings of loneliness at work are consequential. Ozcelik and Barsade (2018) found that lonelier employees are less committed to their

organization and perform worse, and former Surgeon General of the United States, Vivek Murthy (2017) speculated that remote work might play a pivotal role in a broader societal "loneliness epidemic." It is thus more important than ever that we understand how virtual workers come to feel personally connected with each other. Our conclusions indicate that multiplex cadence is an important mechanism in this process. It is our hope that the findings of this study will help enable scholars and managers to facilitate meaningful relationships between remote workers.

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