**Digital Time: The Smartphone, Digital Calendars Temporal Transformation**

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## Abstract

This article investigates the temporal effects of smartphone usage among working-aged adults. In particular, we investigate how digital calendars, built into smartphones, affect their users sense of time. We conceive of time here as a cultural phenomenon (as opposed to a purely empirical measurement of time). Using this cultural lens, time a collectively defined notion, which social actors understand and manage through a variety of tools, such as watches, clocks, and in this case, calendars. We first outline how digital calendars differ from analogue ones and we then investigate how digital calendaring affect these social actors' temporal experience. We summarize findings from a qualitative study, which found that smartphone calendars reveal the world to us as a never-ending list of things to do and people to see. Interestingly, the smartphone calendar often "disappeared" as a technology and became simply part of everyday experience. In this way, the structuring force of the calendar also disappears from view. We also found that smartphone calendars require work themselves. In this sense they are an ironic technology; their primary purpose is to "manage time," but to do so *requires time*. We conclude by suggesting that our findings provide insight into our popular belief of pervasive "time poverty" despite a lack of definitive time-use evidence to support that assertion.

**Introduction: Time as a site of struggle**

The passage of time is a curious human experience: our imperfect brains cannot perceive it either precisely or reliably (Csikszentmihalyi, 1990). Left to our own devices, we often have only a vague idea of what time it is. It is because of this imprecise perception that we have developed tools and symbols to mark time's passage, and it is through these tools and symbols that time becomes a *cultural* phenomenon. Time is a shared system of meaning, which is the very definition of culture (Geertz, 2000). We collectively celebrate festivals and holidays, for example, or agree upon what time "12 noon" is. The shared aspect of time makes temporal experience an *intersubjective* phenomenon, one which structures our individual lives, but must also be negotiated with others. We share a collective notion of time, and then must confront its structuring force with our individual agency. The structure/agency confrontation is a common sociological problem. In this paper, we attend to this problem, with a specific eye on time in general and the calendar in particular.

The tension between the individual and the social is embodied in the tools and technologies we use to reckon time. The sundial, the wristwatch, and the calendar are all time-reckoning systems, each with its own underlying technology. Time-reckoning systems structure social life. They bind us more tightly to collective notions of time, and crowd out our individual experiences of it. The technologies we use to reckon time are a site of struggle, just like the technologies on the factory floor.

Time-reckoning systems evolve out of existing patterns of social interaction, such as ritual or public ceremonies. Durkheim observed the temporal aspects of ritual in *The Elementary Forms of Religious Life*: “The division into days, weeks, months, years, etc., correspond to the periodical recurrence of rites, feasts, and public ceremonies” (Durkheim, 1985, p. 119). Berger and Luckman recognized that the structuring force of collective time reckoning in *The Social Construction of Reality*. They note that time is a “typficiation” in the “socially shared calendar” which includes collectively recognized various rites, celebrations, and holidays (Berger & Luckman, 1966). This “socially shared calendar” tells us when to have certain activities with certain people, which activities come first, and which do not garner official recognition. The socially shared calendar is a time-reckoning system that has a formidable structural force.

Surprisingly, we know little about the *technology* of time reckoning, much less how it affects social relations. Marx recognized the importance of the clock, for example, by pointing out the “tricks” capital played, such as moving the hands of the shop-floor clock to “steal” from “meal time” (Marx, Engels, & Fowkes, 1977, 354-5). In his seminal article, Thompson (1967) traced the emergence of the town clock as a harbinger of a centrally ordered time, based on the needs of industrial capitalism.[1] Indeed, some of the most interesting scholarship on time focuses on the struggle *over* time-reckoning systems. Changes in the English

[1] According to Thompson, “clock time” replaced agricultural time, which marked time through the imprecise moving of the sun from day to night and from spring to winter. Some scholars (e.g., Adam, Whipp, & Sabelis, 2002), have argued that Thompson’s case is overstated and that “clock time” is not as hegemonic as he may assert. While this may be true, Thompson’s focus on the normative force of the clock tells us much about technology’s role in time reckoning.

calendar, for example, ignited riots in 18th Century England, as many believed that observing saints' days on the "wrong" days invited bad luck (Poole, 1998). Japan's adoption of the Gregorian calendar marked its symbolic entrance into the Western-dominated world and its ongoing ambivalence about adopting Western ways (Shimada, 1992). In his ethnographic examination of time and working experience on an assembly line, Roy (1959) found that the most senior workers structured and controlled breaks, which came to be known as "banana time." Newer workers (including Roy himself) were subject to the whims of "banana time," which was never theirs to declare. Also on the shop floor, Burawoy (1979) found manipulating time and its representation was a fundamental aspect to playing the game of "making out," or trying to reach a bonus. Workers played against management, but they also played against each other, often by disguising or manipulating time. Struggles over time-reckoning systems are emblematic of wider societal changes.

This study focuses on a particular time-reckoning technology: the calendar. And more specifically, the digital calendars used on smartphones. The calendar is undergoing a significant transformation. Microsoft estimates that there are 500 million Microsoft Office users worldwide (Microsoft Corporation, 2009), all of whom have a copy of the Outlook digital calendar. All Google Mail users have free access to Google Calendar, and as of January 2012, that includes 350 million users worldwide (Weber, 2012). Increasingly, these digital calendars are mobile, built into smartphones. In the United States, Pew Internet and American Life recently reported (2012) that 46% of all American adults have a smartphone.

In Canada, about 8 million Canadians, or 22% of the entire population now carry smartphones (ComScore Inc., 2011).

The digital calendar differs from the analogue paper calendar in several important ways. First, it is quickly altered through a few clicks instead of the handwriting required of a paper calendar. Adding a new appointment means typing it in, not writing it by hand. Second, unlike a paper calendar, such as a FiloFax, the digital calendar can store many years' worth of scheduling without adding to its physical size. In this sense, it is effectively "bottomless." The paper calendar, by contrast, is bound by physical space limitations. It is typically used a year at a time. Its physical size also limits the number of appointments one can schedule; once the paper is filled with appointments, the paper calendar user realizes that he or she has simply "run out of time." Third, the digital calendar is *networked*. Other digital calendar owners can send digital "invitations" as email attachments, which are effortlessly dropped into the calendar, no typing required. Moreover, depending on the calendar settings, a supervisor may see precisely what that worker is doing, with whom, at what time. Finally, the smartphone's digital calendar is *mobile*, in that it is always available throughout the day. Granted, users have been carrying FiloFaxes on their person for decades, but the smartphone's mobility is coupled with its digital aspects.

Given these characteristics, how does the smartphone's digital calendar affect the temporal experience of its users? How do they navigate the structuring force of this digital calendar? How does this navigation differ from the analogue technology of the paper calendar?

**A gap in the literature**

There remains a distinct gap in the study of time, despite the significant role time-reckoning systems play in social life. The shift to “calendar and clock time” (CCT) is an important motif in the spread of Western political economic ideals, yet CCT remains a “missing anthropological problem in scholarship in general (Postill, 2002). Contemporary studies on time tend to have two limitations. First, theoretically informed studies often fail to examine contemporary technological tools we use to reckon time. This approach offers little insight into our current social practice with current technology.

A quick review of the literature brings to light these twin limitations. It is readily apparent that theoretical approaches have not kept pace with technological change. These studies either focus on the paper wall calendar (Nippert-Eng, 1996; Zalot, 2001)or the paper FiloFax (Coffey, 1994), which gives us little insight into what millions of people are currently doing with their smartphone calendars. These analyses are symbolically rich and theoretically meaningful, but they leave out a sizeable portion of contemporary time-reckoning practices.

A second limitation of this literature is that empirical studies of technology tend to focus on the technology itself and not on time as a socio-cultural phenomenon. While this approach may offer insight into how people use current technology, it offers little insight how individual actors resist hegemonic time practices. Sell (Sell, 2008; Sell & Walden, 2006) for example, found digital

calendar users reported high satisfaction accessing their calendars on their smartphones, largely because it improved their “efficiency.” But what does “efficiency” imply here? Did these users resist the use of these calendars? Other studies found calendar usage patterns differ, depending on job category (Cooke & Kroeze, 2004; Tungare, Perez-Quinones, & Sams, 2008) but there is little insight into the nature of these differences. More recently, Leshed and Sengers (2011) found a “pervasive culture of busyness” in among users of various “productivity tools” including digital calendars, but the objective of their study was to provide specific design recommendations, and not examine the social implications of this culture.

In short, the literature of time reckoning and technology fails to provide a robust sociological analysis of contemporary technology. Our study fills this gap by studying mobile digital calendars, which are embedded in smartphones.

**Method**

Our study included field interviews, extensive field note taking, and face-to-face interviewing. Through the course of our research, we also made ample use of digital photography to allow the research team to better analyze the symbolic arrangements of our participants’ homes, offices, and cars. Fieldwork was conducted in the late spring and early summer of 2011. Twenty-nine smart phone users were recruited through word-of-mouth and social media. Nineteen were men and 10 women were interviewed. The research team conducted “long interviews” (McCracken, 1988) with participants in their homes, cars, and offices, which offered the opportunity to collect symbolic data of the

smartphone within the context of the home, the office, and “interspace” (Hulme and Truch, 2005). We make no claim to the statistical generalizability of these findings. This paper is exploratory, intended as an entree into the literature and an invitation to begin a dialogue about these emergent findings.

**Findings**

The smartphone serves as a personal “command centre,” the same purpose Coffey (1994) found the FiloFax played. But unlike the FiloFax, the smartphone calendar has a “bottomless” view, well into the future. In this way, the smartphone digital calendar reveals the as an *endless* series of things to do and people to meet. Increasingly, this lens also reveals the domestic sphere as a never-ending list of things to do and people to meet. Our participants, through regular consulting of their smartphones, come to see the world as this perpetually updated list of activities. Not all participants were heavy calendar users, but the majority used the mobile calendar as the primary window to their daily lives.

The smartphone’s calendar was tightly integrated with other tools these participants interacted with throughout the day. Other communication tools like email, text and voice phone calls made the smartphone an object of more intense interaction than the paper calendar. Moreover, some participants synced their smartphones with their computers, making its contents constantly available and and almost ambient part of everyday working life. Because of this, the smartphone’s digital calendar “disappears” from view, thereby obscuring its structuring force. Unlike the town clock, which is patently visible to all, the

smartphone's digital calendar silently and often invisibly structures everyday life. In this sense, resistance to the structural effects of this kind of time reckoning is harder to discern and enact.

**A networked constant companion**

The smartphone's small size made it an easily carried and easily consulted tool. It was often an intimate object, carried close to the body or inside private purses. It was regularly and effortlessly consulted throughout the day. Its role in structuring everyday life was significant, and its taken-for-grantedness was also clear. One participant called his smartphone "the bible," while another called it the "secretary for the day," which "completely and totally [organized] every aspect of my life." Participants regularly consulted their digital calendars to tell them what they were expected to do and where they were expected to be. As one participant put it:

> In the sense that the mobile device that I carry with contains my calendar. And my calendar is my day. It tells me when I'm running late, where I'm supposed to be, what's going on and who I should be talking to at that moment. During the work day without that I literally truly would be lost. I'd be missing meetings all the time. Participant 1032.

As another participant put it, the calendar was "a framework to operate in." In this sense, the smartphone's calendar frames the participants' activities. They may choose to ignore what is entered in the calendar, but it nevertheless shows them what they are "expected" to be doing.

Significantly, the smartphone's calendar often disappeared from view; participants frequently "forgot" that they used the calendar at all. Some

participants did not include “calendaring” in a list of the functions they used on their phones. But these same participants conceded it was indeed a primary feature of their smartphones when asked about calendaring directly. This participant’s reaction was typical of this “disappearance” effect:

> Yeah, primarily, I’m just [using my BlackBerry] for phone, email and that’s really about it.
>
> And that’s it, eh? What about calendaring?
>
> Oh that’s a good point. Yes, I check my calendar, obviously. If I’m out [of the office] today, as an example…and they schedule [the next meeting], then I will pull it [in my BlackBerry]. Participant 1104.

In this sense, the mobile nature of the smartphone calendar is often invisible to its users because it is part of normal everyday experience. The technology simply disappears. But it certainly re-appears when it fails to function. As this participant noted, “losing” a digital calendar has significant effects:

> I run my life off the calendar on the BlackBerry. I don’t sync it to anything else. I have in the past lost a BlackBerry. Once it was stolen and I didn’t know what I’m doing for the next month, and appointments would come and I’d miss them completely because it’s all there. – Participant 1039

The significant effect of “losing” the smartphone’s calendar demonstrate how central its role is. Without this “framework,” participants would not know what activities they are supposed to be doing.

**Bottomlessness: the endless to-do list**

The smartphone’s calendar is a personal tool for organizing one’s time, and that organization work can potentially go on forever. Users were “working” on managing time when they used the smartphone’s calendar. As one participant

put it, he sees the digital calendar as “very clean” and allows you to “delete” items as they are completed. He explained:

> I can delete it when it’s done because when you have to-do lists on paper, you just keep them. So I like that it’s very clean. It hasn’t changed me as a person. I just really like that. So I guess it just um, shows like, makes me have that quality that I was looking for, for it to be more clean and organized, yeah. You said about time. No, I don’t think that my perception of time has changed at all. Participant 1021

At first glance, it appears the smartphone calendar did not significantly change his perception of time, yet he found it “cleaner” than his paper calendar. This suggests his perception of time *has* changed. He gains a symbolic advantage when he “deletes” items in his calendar instead of merely “crossing them out” on a paper calendar. The “cleaner” experience is one of feeling like one is better managing one’s time. In this sense, the smartphone calendar is a tool for managing the anxiety of not having enough time.

The “bottomlessness” of the smartphone calendar was evident in how the organized or tended to them, or what we call “event pruning.” The “event pruning” of appointments and tasks was often an “interspace” activity, thus confirming that the *mobile* nature of smartphone calendar is a key aspect of its use. Because the calendar was always with them, they began to regard “free” moments as opportunities to plan future events. As one participant put it:

> Um, I will, it’s really the only place I schedule anything in. Unfortunately, I’m too lazy to sync anything, ever, so all my meetings, deadlines, reminders…I’ll just plug them in. If I’m on [public transit] I’ll think I have to get this done, I’ll find a slot and I’ll put it in. I have…stuff I recently put in for the end of August that is to remind me to plan for the fall. Some time in late August, I’ll get this annoying note and I’ll hate myself for putting it there, and it’s remember to plan this, this, this. I’m even planning planning now. Participant 1039

Through organizing a calendar, one is trying to better organize time and somehow "make time" in the process. This participant's tendency to "plan planning" is his attempt to create more time, but quixotically, he is actually spending time planning. This irony reveals the essence of the smartphone digital calendar: it *appears* to offer efficient scheduling of events and to-dos. But *in practice*, it becomes its own task, requiring attention and work. This irrational "planning planning" is a symbolic activity that alleviates a deep sense of anxiety of never having enough time. But event pruning itself is work – work that is never done because time is never done.

**A perpetual to-do list**

Most participants used the calendar as both a list of appointments and a list of to-dos. When used in this way, there was very little difference between an event and something to do; the to-do and the appointment have become somewhat interchangeable.

> So my alarms are on my phone. I create alarms if I need to remember to do something. So for example, if I were going to the dentist today, I would have an alarm half an hour before I have to go saying go to the dentist and get ready, and I think the to-do list is kind of like organizing my time but not exactly. 1021

This participant saying "not exactly" indicates that he senses that by using his smartphone calendar, he is not truly organizing his time, even though that that's what it appears to be. In this sense, participants were using the smartphone calendar not as an agenda, but as a reminder system to do even the most mundane tasks. Yet, it was this practice of using the smartphone that "not really"

organizes time. The task will still need to get done; the smartphone only *reminds us* that a task is undone. As this participant noted:

> So like for tonight, I have get milk.
>
> Interviewer: That's in your calendar.
>
> It's in my calendar but it's not something in my office [calendar] …Um, but you know, it will go off as a reminder. So that's, I use the calendar and for reminders to do stuff. 1109

In this sense, the calendar is not a list of *people to see* so much as a list of *things to do*, which includes appointments, buying milk, picking up children, and deadlines at work. The social actor still must buy milk, pick up children and meet work deadlines. None of these tasks are done faster or better with the smartphone – they are simply organized conceptually by the smartphone. Without the smartphone, the individual may forget about the task, and thereby be alleviated from knowing about what is left to do. The smartphone's calendar makes *reminders about tasks and appointments*; it does not "make time."

**No division between home and work**

Our findings mirror Nippert-Eng's analysis of the paper calendar as a symbolic division between work and home. Appointments about children's sporting events and "play dates" were viewed next to work events and viewed on the same device, though they technically resided on "different" calendars, i.e., one labeled "work" and the other "home." Colour coding or using different calendar names reinforced this largely symbolic division. But like with paper

calendars, this exercise was largely symbolic, and perhaps even more so than with paper calendars insofar as there was no physical difference between the "home" and "work" calendars – they were viewed and edited in the same way on the same device. Some participants dispensed with this largely symbolic division and simply scheduled personal events in their "work" calendar because it was perceived to be "too much work" to have separate calendars.

Participants had additionally started using workplace calendar practices to organize personal events. Some regularly sent digital "invites" to family, which would be automatically embedded in each other's calendar. One young lawyer told us how he had "trained" his father to start using digital invitations to organize family dinners.

The networked character of the digital calendar brought convenience, but also some unintended consequences. Another participant's wife, who was present at our in-home interview, offered up this description of how domestic tasks get organized. Participant 1030 and his wife regularly use smartphone calendars for work, and have begun using them to organize domestic tasks as well. But because 1030's secretary has access to his calendar, his secretary organized domestic tasks according to workplace priorities, not domestic priorities. This was sometimes at odds with his wife's needs:

> 1030's wife: It's a little strange cause the admin responds sometimes.
>
> Interviewer 2: Oh, tell me about that.
>
> 1030: Well the first time I had a meeting and she, it was the day before, at a 6:00 meeting and [my wife] sent a meeting invite at 5:30 to pick up the kids and [my secretary] 'proposed a new time'…

> 1030's wife: And I was like what? There's no new time! Not for that! And then Children's Aid comes to the door!

Participants who attempted to create firmer divisions between home and work calendars found that two physically separate calendars was a recipe for disaster. One participant had attempted to keep a paper calendar of personal events on her office wall, but was continuously "forgetting to check" the calendar before she left the office and missing events because of it. Another participant continues to try to use a completely different system for personal appointments, but he reports very little success:

> I try and store that in my brain, which is a very bad mistake, or I try and write it down on a calendar which is also a very bad mistake because I never leave the house having looked at the calendar. So in either case, I've left the house having put nothing on here [on the smartphone] and having not looked at my calendar. So usually flying blind most of the time. 1031

The smartphone calendar is indeed bottomless and gives the participants the mistaken impression that they can cognitively appreciate all their appointments and to-dos. Those that attempt to remember their calendars with their minds alone find very quickly that they are unable to remember everything. They simply cannot remember the sheer number of things the mobile digital calendar contains. They have not created "more time" but they have certainly created the *ability to schedule more things*. This participant who is "flying blind" is actually demonstrating how the mobile digital calendar outstrips our cognitive ability to keep track of life events. The smartphone's calendar makes us believe we can cognitively process that many things to do, but our minds simply cannot keep that

many activities in memory. In this way, the smartphone fools social actors into thinking that this many activities is humanly do-able.

**Discussion: Time poverty as contemporary social problem**

How do smartphone calendars affect individuals' temporal experience? In a very subtle and often unseen manner, smartphone calendars present the temporal landscape as one that can be filled *ad infinitum* with activities. Our participants did not consciously recognize this, so they did not employ strategies or resistance to avoid the structuring force of the calendar. At most, they "ignored" items in their calendars or "deleted" reminders, but they did not resist the form of the calendar itself: a "bottomless" empty box, waiting to be filled with things to do and people to see.

Our findings can provide some insight why "time poverty" has captured the popular imagination, even though time-use studies have not found reliable evidence of longer working hours. The popular press paints a dystopian picture of interrupted vacations and of families struggling to carve out time (Belkin, 2007; Belson, 2007). But in the scholarly literature, time poverty continues to be a controversial topic. Some scholars report both qualitative and quantitative shifts in working time and intensity (Hochschild, 1997; Schor, 1991), while others argue that we are not working more hours but simply engaging in more simultaneous activities (e.g., see Robinson & Godbey, 1997; Robinson & Martin 2009). Still others argue that workers on the whole are not be working longer hours, but that highly skilled workers are working extremely long hours (Blair-Loy, 2004;

Gershuny, 2002). From academics to bankers, scholars report a pervasive sense of extremely long working hours (Menzies & Newson, 2007). At the same time, others find clear evidence we are not working more hours (Fisher & Robinson, 2009). It simply has not been definitively established that all people are working more and relaxing less, yet we continue to see the theme of time poverty in popular discourse.

In one sense, it is irrelevant whether we are actually working "more" hours because, collectively, we are *feeling* more rushed, more time starved, and "busier than ever" (Darrah, Freeman, & English-Lueck, 2007). This collective belief – whether "true" or not – is a part of our contemporary, common stock of knowledge. We make decisions, allocate resources, and organize our lives based on this common belief of time poverty.

Time poverty is not be reducible simply to a measurable quantitative shift in working hours, but understood instead as a constant sense of needing to do more. Always knowing that one has more undermines age-old social and biological rhythms. Regular intervals of feasting, resting and working constructed the earliest human systems of reckoning time, connecting time to material conditions (Aveni, 1995; Holford-Strevens, 2007). Organisms from bees to oysters to mice demonstrate temporally consistent cycles based on material needs to eat, rest and relax (Aveni, 1995; Duffield et al., 2009). Our sense of having more to do undermines this ability to relax, regardless of whether we actually complete these tasks. We experience time poverty as a subjective state of mind, and, at times, as an empirically measurable phenomenon.

Unlike the FiloFax or the paper wall calendar, the smartphone can have a potentially limitless number of years available to be filled with plans. FiloFax users ritualistically re-fill their calendars at the end of each year. They physically remove last year's paper and insert the next year's paper. Smartphone calendar users never "add" years to their calendars – those years are already there, waiting to be filled. In this sense, the bottomless nature of the smartphone's calendar reveals our lives to us as a never-ending set of things to do. The smartphone calendar's ability to "disappear" offers some insight into why we may feel busy – we are unaware of how much the calendar structures our lives.

Our research also begs several new research questions. Why do some participants use their calendars more heavily than others? What organizational variables affect this type of use? In our research, we uncovered some insight of what can only be described as an organizational "panic culture," which prizes responsivity above all else. Because our study was not based within organizations, we did not have sufficient data to uncover this type of responsivity. Future studies could examine organizational "time norms" and what effect these have on perceived time poverty and stress.

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