Casual Microtasking: Embedding Microtasks in Facebook

ABSTRACT

Microtasks make it possible for people with limited time and context to contribute to a larger task. In this paper we explore *casual microtasking*, where microtasks are embedded into other primary activities so that they are available to be completed when convenient. We present a casual microtasking system that extracts writing microtasks from Word and inserts them into the user's Facebook feed. From a two-week deployment of the system with nine people, we observe that casual microtasking enabled participants to get things done during their breaks. The microtasks introduced a new interactive element into the Facebook experience that they tended to attend to only after first engaging with the social content. Participants were most likely to complete the writing microtasks during periods of the day associated with low focus, and sometimes opened Word after completing a few writing microtasks. These findings suggest casual microtasking can help people leverage spare micromoments to achieve meaningful micro-goals, and even encourage them to return to work.

Author Keywords

Task, interruptions, microtasking, casual microtasking.

ACM Classification Keywords

H.5.m. Info. interfaces and presentation (e.g., HCI): Misc.

INTRODUCTION

The nature of work is changing – individuals are increasingly multitasking, remote work is increasingly feasible, and many rote tasks are beginning to be automated or simplified. As a result, traditional structure and modes of working may no longer be required, nor necessarily preferred, to alternative working styles. Individuals can more flexibly complete tasks, work when and where they desire, and interleave different tasks more readily [27, 28, 29].

Microtasks offer an interesting alternative to conventional tasking, providing a way for workers to complete usable work in context free, bite-sized pieces. Because they are quick to perform, microtasks allow people to work without having to set aside large blocks of time and while mobile [2, 21, 25]. And due to their limited context, they are easy to share with others and thus commonly used within the context of crowdsourcing [3, 7, 8, 16]. More recently,

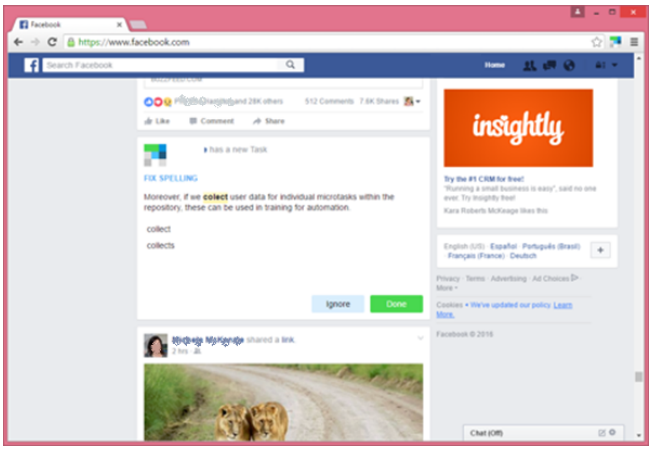

Figure 1. A screenshot of a person's Facebook feed containing a casual writing microtask that was extracted from Word.

research has begun to explore these in the context of personal productivity tasks [5, 21, 23, 24]. This research has suggested several benefits to this approach of work, such as increased quality and grater resiliency to interruptions when completed as a series, versus a single larger task [7].

In this paper, we explore utilizing microtasks in a casual setting – as a way to allow for productivity during the micro-moments people have during the day [5]. More specifically, we are interested in studying the perceptions around interleaving microtasks with non-work related activities and how people engage with these tasks. Currently when people want to complete microtasks, they must actively seek them out by, for example, visiting a microtasking platform like Mechanical Turk or a special application on their mobile device [2, 21, 25]. This requires a conscious effort on the individual's part to choose to engage with microtasks. However, many microtasks are well suited to be completed casually, interleaved with other tasks. For example, one might reply to an email from their phone while standing in line or look up a quick fact while browsing Facebook. We propose *casual microtasking*, where simple microtasks are passively presented tasks to users while they are engaged in some other activity. This borrows from the concept of casual gaming, where a game's simplicity and lack of commitment make it possible for players to make progress in the context of other tasks [15].

In this paper, we explore the setting of Facebook as a possible platform for casual microtasking. Facebook is commonly used as a way to take a break from a primary task or to transition between tasks, especially at work [17]. Usage of Facebook often occurs when individuals feel bored with

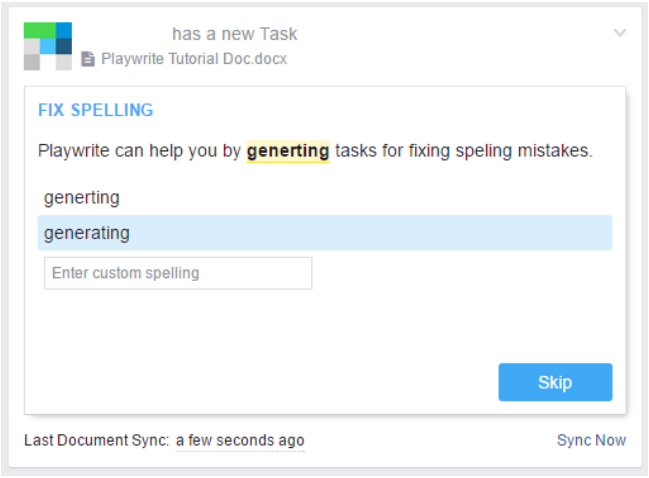

Figure 2. A spelling correction task card as it appeared in Facebook.

their current task or are seeking a break from their primary activity. However, a recent Pew Research report shows evidence that while workplace social media interactions are important for taking mental breaks during work, connecting with family and friends, 56% of the respondents also reported that social media distracts them from work [30]. Our exploration is two-fold – do people engage with such work-related microtasks while taking a break, and if they do, does the engagement help them return to their productivity related tasks?

To this end we developed a casual microtasking system that inserts writing microtasks extracted from Word into the Facebook newsfeed. As an example, Figure 1 shows an embedded microtask that enables a person to edit a sentence from one of their Word documents while browsing Facebook. We deployed this for two weeks with nine active Facebook users who edited documents as part of their job. Participants found casual microtasking to be a fun way to make progress on work during Facebook breaks, and they were able to ignore the microtasks when they did not feel like engaging with work related activities. Participants typically completed microtasks after interacting with the social content, and 20% of the time they launched Word after seeing the casual microtasks in their feed. This suggests that casual microtasks are a way for individuals to continue to feel and be productive when taking a break or transitioning from their primary task, especially during the periods in the day associated with low-focus.

RELATED WORK

Microtasking is prevalent in crowdsourcing, in part because microtasks require limited context and allow crowd workers schedule flexibility [20]. While microtasking is traditionally associated with crowd work, the microtask structure can also be beneficial to individuals [23], enabling people to complete large tasks in many brief moments when they want to be productive but do not have a long, uninterrupted period of time [5, 21, 24]. In general, breaking large macrotasks down into a series of small, context-free microtasks can lead to higher quality work, reduces task complexity, and makes the task more resilient to interruptions [7]. Research has shown that a variety of complex tasks can be decomposed into smaller microtasks [13]. We focus on the microtasks associated with writing which, despite being a task that requires periods of focused attention, contains subtasks that can be completed with limited context [10]. For example, systems like CrowdForge [14] and the MicroWriter [24] break content creation into a series of simple microtasks like preparing an outline, brainstorming ideas, and writing simple prose, and Soylent [3] divides common editing tasks like proofreading and shortening into microtasks. The Mechanical Novel [12] demonstrates an iterative approach to identifying writing subtasks by decomposing high level goals identified during a reflection phase.

Our focus is on casual microtasking, where the completion of microtasks is not the user's primary goal. Several research systems have looked at helping people complete microtasks using free micromoments embedded in other activities. For example, Twitch [25] gives people microtasks to complete as part of their phone's unlock process, WearWrite [21] lets people provide quick document feedback from a smartwatch, and Wait Learning [5] helps people learn new vocabulary words while waiting for a chat reply. People can even successfully enlist their friends to complete microtasks through Facebook [4].

To take advantage of the prevalence of social media use in the workplace, we study casual microtasking in the context of Facebook. Common reasons for using social media at work include taking a break following rote work [17], socializing, escape, distraction [1, 22], and learning about coworkers [9]. Social media breaks can be useful, with social media use coinciding with low stress [19] and a positive mood at the end of the day [18]. However, research also shows an association between the time people spend on social networking sites and low effort thinking [26]. In this paper we build on previous research that shows microtask structure can help people complete complex tasks during free micromoments to study the impact of providing people with writing microtasks during workplace Facebook use.

BUILDING MICROWRITING INTO FACEBOOK

To do this we built a casual microtasking system in the context of Facebook on top of an existing research-based microwriting system [under submission]. The underlying system uses a Word add-in to extract microtasks from a document and store them in the cloud. When the user visits Facebook, our system then fetches these extracted microtasks from the cloud using a Chrome extension and integrates them into their newsfeed (Figure 1) as microtask cards (Figure 2). We implemented six types of microtask cards:

- *Fix spelling*. The Word API provides access to spelling errors. For sentences containing spelling errors, the user is shown the sentence with the error and asked to select the correct spelling from a list of alternatives.

Figure 3. The experience survey participants received before and after Facebook visits.

- *Identify a wordy sentence*. We also used a natural language processing system to algorithmically identify sentences that are verbose. For verbose sentences, the user is shown the sentence and asked to reply to the question, "Is this wordy?"
- *Shorten a sentence*. If the user identifies a sentence as wordy, the user is then shown several shortened alternatives, created using the natural language processing system, and asked to select their favorite.
- *Accept/reject a change*. Word also provides API access to tracked changes. The user is shown a sentence containing a change and asked to accept or reject it.
- *Address a comment.* Comments in the document are shown for triage. A user can either acknowledge a comment as an FYI, delete it, or indicate that it requires a response. For comments that require a response, the user is then asked to write a reply.
- *Address a to-do comment*. For the subset of comments that begin with the string '#todo,' users are given an additional option when addressing the comment: they can also edit the text in response to the comment.

The microtasks are designed so that each take a few seconds to complete and are independent of each other. A new microtask card is shown every time the user scrolls 2000 pixels through their newsfeed, starting after the first 2000 pixels. Taking a cue from Facebook advertisements – which have strict design guidelines regarding atheistic and user experience – we designed the cards to be as unobtrusive as possible. They were carefully crafted to appear like other Facebook content, as shown in Figure 2, using the typographical hierarchy, color pallet, and design of existing Facebook content. Users could easily scroll past a task if they did not want to complete it, much like they now scroll past ads on Facebook. Additionally, if users were interested in doing work but did not like the available task they could easily request a new task using a large "skip" button. The distinction between these two actions – actively skipping versus scrolling past, enabled us to gain insight into if a person wanted to complete a task, but just wasn't interested in the one shown, versus they didn't want to task at all.

When a user completes a microtask, the output of that action is pushed to the cloud and the user is presented with another microtask card from the same document in the same location in the newsfeed. After the user is presented with 3 to 5 microtask cards in the same location the user receives a prompt encouraging them to either open the document or continue scrolling. The type of microtask shown at any time is selected randomly, and if the user choses to actively skip a microtask this deprioritizes the future display of microtasks of that type.

Lastly, when the user opens a Word document that has corresponding completed microtasks stored in the cloud, the Word add-in will fetch the output of those microtask and modify the document accordingly. For example, spelling corrections and shortened sentences will appear as changed text, tracked changes that were accepted will appear as accepted, and comments with responses will have replies.

	Microtasks shown	Microtasks finished #	Microtasks finished %	Documents opened
Spelling	189	45	24%	0
Wordy	184	48	26%	1
Shorten	24	15	63%	0
Change	17	3	18%	0
Comment	23	11	48%	0
To-do	8	6	75%	1
Total	445	128	29%	2

Table 1. The number of microtasks that were shown and finished during the two-week period, broken down by type.

STUDYING MICROWRITING IN FACEBOOK

To study how users interacted with the microtasks during their Facebook browsing sessions, we deployed our system for two weeks with nine daily Facebook users who were actively editing Word documents. Participants were a mix of interns and full-time employees in a large software company, recruited through a general email call. Five were male and four female, with an average age of 29 years (SD=4.72). Participants were compensated $50 for their time during the study.

After participants installed the Word add-in and Chrome extension, we asked them to use Facebook and Word with their own documents as they would naturally for the next two weeks, and collected data on their use via:

Experience sampling: At the start of every Facebook visit participants were given a survey, shown in Figure 3, that asked whether they felt bored, frustrated, relaxed, and productive on a 5-point Likert scale. Participants who completed the survey at the start of their visit were also asked to complete the same survey 2 minutes after they left.

Daily survey: At the end of each work day participants were also emailed a survey that asked their overall feelings for the day, mirroring the experience surveys. Additionally,

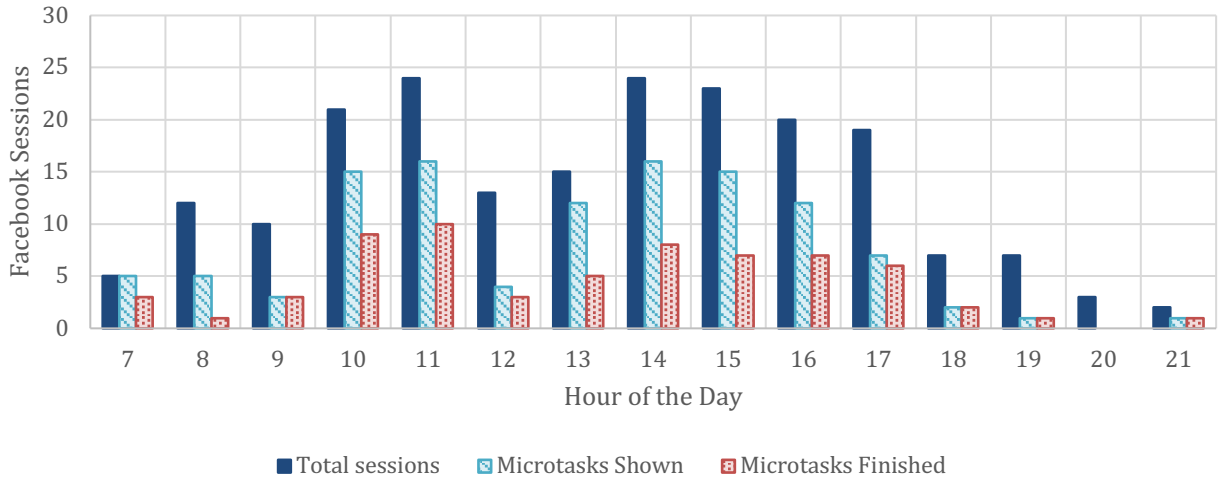

Figure 4. Breakdown of recorded Facebook sessions by time of day and whether a microtask was shown and finished.

participants were asked about that day's document progress and Facebook use, as well as their opinion of the microtasks they did and their impact on their Facebook use.

Exit interview: Finally, at the end of the study, we conducted semi-structured interviews with each participant to learn how microtasks affected their Facebook experience, what the microtasks helped them accomplish, and their experience with microtasks in their newsfeed.

Logging: Additionally, we logged the types of microtasks that were extracted and inserted into each person's Facebook feed, details of the actions (if any) that they took on the microtasks, and their use of Facebook and Word.

UNDERSTANDING MICROWRITING IN FACEBOOK

Using these data, we look at when our participants were shown microtasks when they visited Facebook, when they performed the microtasks they were shown, and how the experience impacted their ability to return to work.

Seeing Microtasks in Facebook

Participants visited Facebook a total of 205 times during the two-week period, or an average of almost six times a day each. Microtasks were shown in 56% of these Facebook sessions, with 445 individual microtasks shown in total. Table 1 shows the microtasks that were shown broken down by microtask type. The simplest microtasks, designed to address spelling errors or identify verbose sentences, appeared the most. Other microtasks appeared less often. For example, shortened sentences are only shown following an affirmative reply from the "Is it wordy?" microtask, thus could only appear at most as often as that microtask was finished. And because only two participants were working on collaboratively edited documents, the total number of tracked changes and comment microtasks extracted was relatively low. The to-do microtask requires users to use specialized syntax (by including '#todo' in their comments), and thus was the least common of all.

Figure 4 shows the number of Facebook sessions participants engaged in broken down by time of day. We observe that Facebook sessions occurred throughout the day, with most sessions happening bi-modally in mid-morning (10am to 11am) and in the afternoon (2pm to 5pm). This aligns closely with the pattern observed by Mark et al. [17] for focused attention, with focused periods tending to peak in mid-morning and mid-afternoon. Five of the 9 participants specifically mentioned working on microtasks in the afternoon, citing it as a break after lunch or a time period when they typically "would get bored."

Microtasks Did Not Feel Invasive

Generally, the presence of microtasks did not appear to interfere with participants' ability to browse Facebook for social purposes, and they found the microtasks easy to skip. For example, one participant stated that she, "Definitely ignored [the microtasks] at sometimes" when visiting Facebook, however she "always felt that they were cool." In fact, participants only completed about 29% (129) of the total microtasks they were shown.

Doing Microtasks in Facebook

Despite the microtasks being easy to skip, for most (58%) sessions where a microtask was shown at least one microtask was completed. And when a microtask was completed, participants typically did 1.53 microtasks before either continuing to scroll through their feed or leaving Facebook. The microtasks appeared to offer a new opportunity for engagement in Facebook; four out of the nine participants mentioned enjoying the game-like aspect of it. For example, one participant noted, "It was nice to have something interactive in Facebook. I don't have a lot of interactivity in Facebook aside from leaving comments." Two participants stated they wished they could do microtasks from their mobile Facebook app, since that was their primary entry point to their feed. Only one participant specifically cited being annoyed by the microtasks in Facebook, saying they decreased the overall fun of Facebook for him.

Types of Microtasks Finished

Table 1 shows the microtasks that were shown and finished, broken down by microtask type. To-do, shorten, and comment are the three that were most likely to be completed given they were shown. This may be because all three are triggered by a direct request from a person; to-do microtasks are generated from comments in Word that are prefaced with #todo, shorten microtasks appear in response to the "Is it wordy?" microtask, and comments are actively added to the document. This active triggering may suggest the microtask output is likely to be of high value. However, participants were least likely to complete another microtask type actively triggered by a person: tracked changes. Our observations suggest this is because addressing other people's document edits requires a lot of context. One participant, for example, mentioned that comment microtasks, "Were useful, however only about 60% of the time I felt like I had enough context to do them."

Lower Effort Microtasks Preferred

In general, participants appeared to like completing microtasks when they were easy, low-cost, and required minimal context. For example, one participant reported, "I liked the 'Is it wordy?' – and the spelling mistake. They were low cost. Some of the task types were easier to do / lower cost. The comment tasks were definitely much harder. There were some where there was not enough context. But otherwise, they were just too much work." Seven of the nine participants asked for more microtask types, including ones to make grammatical changes, formatting adjustments, or write content, and three participants wanted microtasks from their other work activities included as well.

Participants skipped 44 out of the 128 microtasks (34%) that were completed. This indicates that they either were satisfied with the existing text or they did not want to engage with that task at that moment.

Lower Priority Documents as a Source of Microtasks

In addition to preferring to do the easier microtasks, participants appeared to prefer to complete microtasks from documents that were of relatively low priority. The rationale was that this allowed them to feel productive on those documents by doing a few microtasks without having to engage deeply. Instead of spending time opening Word and engaging with the document, they were instead able to complete a few microtasks each day and slowly make progress on what needed to get done. One participant mentioned, "If I had a few of these minor things each day – it could really help your document over all. It's like chipping away at the document – it was normally time I would be wasting."

Another participant actively structured one of her shorter documents to support progress through the casual microtasks, making custom to-do microtasks for it. At the end of the study period she pulled the output from to-do microtasks back into her document, cleaned up the transitions as necessary, and sent it on its way. She said, "I never worked on the document – because it was such a short document. I thought I would get through all of the task just by browsing on Facebook. Then I would go back to the document at the end. Maybe if this were a longer paper – I would rather work on the actual document too."

Participants found it harder to do microtasks that were associated with higher priority documents or more complex documents. In some cases, this may be because the microtasks were not as well suited to the larger task. One participant noted that, "It felt like – if I was writing a very simple document, it worked well. But for longer documents / legal documents – the suggestions were not helpful."

Users Engage With Microtasks When They Feel Less Productive

As observed earlier, participants visited Facebook at work most in the mid-morning and mid-afternoon, which are times when focus typically peaks [17]. However, as can be seen in Figure 4, they actually interacted with the microtasks in the opposite way, completing a much higher percentage of the microtasks they encountered at the beginning, middle, and end of the work day than during the mid-morning and mid-afternoon. For example, participants finished 75% of the microtasks they were presented with during their lunchtime session, but only 42% during the typically highly productive time right after lunch. They also spent more time on Facebook when they interacted with the microtasks; their sessions averaged 4:54 minutes in length when they finished a microtask, and 3:48 when they did not ($t(52)=2.04$, $p<.05$).

It may be that during periods of high focus at work Facebook serves primarily as a break, while at the beginning, middle, and end of the day it also serves as a transition into and out of work. In the experience sampling surveys, participants reported doing microtasks during the sessions where they felt less productive ($p<.05$) and less relaxed ($p<.05$). For example, one participant said she completed microtasks differently as a function of how she was using Facebook in the context of her work: "If I was very committed to going on Facebook – I would skip the tasks completely. If I was taking a short break – then I would go through the tasks (because I want to think about them). If I was more procrastinating, then I would be like fine – and just go back through the document." Another participant said he visited Facebook when "bored and not sure what to do" and when he "didn't like the task he was doing." However, if he completed a microtask in his Facebook feed, he would often "switch to the paper" and continue working on it.

Getting Back to Work

Consistent with this experience, the microtasks appeared to encourage participants to get back to work. In the daily survey they tended to agree ($M=3.76$, $SD=0.73$) with the statement that, "The tasks in my Facebook news feed encouraged me to go back to work." We see further evidence for this in the log data in that they were more likely to do microtasks at the end of a session. Participants spent an average of 2:24 minutes on Facebook before doing their first

microtask, ignoring 2.5 microtasks in the process. This could be because they wanted to first take the desired break and then decided to engage with work. As one participant said, "Sometimes I would lose track of time on Facebook, and it would help to snap you out of the time-wasting experience."

Six of the nine participants stated that the microtasks served as explicit reminders to work on the associated document. Using the log data, we were able to determine that after 2 minutes of starting a Facebook session, Word was opened 20.5% of the time. The act of completing a microtask does not appear to be a factor; when the session had a task completed in it, Word was opened 20.8% of the time. However, the casual nature of having writing microtasks in the feed may have resulted in a higher base rate. In the interviews, users said they would open the document between 25% to 33% of the time, often before completing a microtask. This is in line with the suggested subtle reminders recommended by Iqbal and Horvitz [11] to break the chain of distraction.

LIMITATIONS AND FUTURE WORK

Our results suggest that people found the tasks in Facebook to be useful, non-intrusive, and a unique way to perform work. However, both the scope of our study and casual microtasking intervention were somewhat limited, in order to allow for effective exploration without prohibitive implementation costs. The casual microtasking system only had a handful to task types that individuals could complete. We actually received feedback for a number of new microtasks we should consider implementing, including a task to expand on a section, or fix the formatting of some text. Some users suggested even having more complex tasks in Facebook for them to work on. However, this simple implementation still allowed us to explore how individuals would react to having work tasks appear to them in Facebook, regardless of the how useful the entire experience was. In the future, we plan on expanding the number and types of tasks, as well as exploring other activities (e.g. email) and platforms (e.g. Reddit).

As a result of the limited implementation, we also limited the scope and size of the study. The integration was with Microsoft Word, necessitating the use of individuals who were working on Word documents as participants. Additionally, the length and nature of the study (field) required for us to use individuals who were easily reachable were they to encounter any issues using the microtasking system. While this might limit the generalizability of the results, the activity our participants were doing (document editing) is fairly common across knowledge work. In the future, we hope to do an expanded, real-world deployment, investigating how this would impact work in other fields.

Lastly, adding work to Facebook, a tool generally utilized for relaxation and personal entertainment, could be alarming. There is the potential for this to be exploited as way to demand additional work from workers. However, casual microtasking in Facebook could be viewed as a win-win for both parties – instead of blocking Facebook, organizations could allow Facebook, with the chance that people might use it as a way to switch between tasks or work on a side task more fluidly. As we saw in the results, users commonly ignored tasks, and did not appear bothered to just scroll past a work task. While this could be due to the limited nature of our study, we think there is promise in this approach, and warrants additional investigation.

CONCLUSION

We studied casual microtasking by inserting writing microtasks into people's Facebook feeds. By analyzing this experience with nine people over two weeks, we find that casual microtasking enabled participants to make writing contributions in a fun way during their Facebook breaks, while still allowing them to ignore the microtasks when they did not feel like engaging with work. Casual microtasking was particularly useful for completing microtasks associated with low-priority documents that required limited context because it helped them stay engaged with those documents without committing to larger edits. Casual microtasking offers a new way for individuals to complete work in alternative contexts, acting an avenue for reminding, completing secondary tasks, and as a doorway back to productivity.

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