

Casual Microtasking: Embedding Microtasks in Facebook

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ABSTRACT

Microtasks enable 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 experience that inserts writing microtasks from an existing microwriting tool 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, and that they tended to do so only after first engaging with Facebook's social content. Participants were most likely to complete the writing microtasks during periods of the day associated with low focus, and would occasionally use them as a springboard to open the original document in Word. These findings suggest casual microtasking can help people leverage spare micromoments to achieve meaningful micro-goals, and even encourage them to return to work.

CCS CONCEPTS

• **Human-centered computing** → **User interface management systems**;

KEYWORDS

tasks; interruptions; microtasking; casual microtasking

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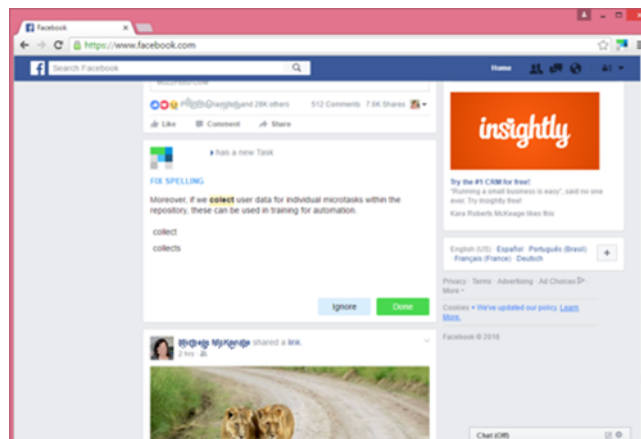


Figure 1: A screenshot of a person's Facebook feed containing a casual writing microtask extracted from Word.

1 INTRODUCTION

The nature of work is changing – individuals are constantly 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 [9, 12, 24].

Microtasks offer an interesting alternative to conventional tasking, providing a way for workers to complete usable work in context free, bite-sized pieces. Because microtasks are quick to perform, they allow people to work without having to set aside large blocks of time and while mobile [2, 15, 29, 33]. Additionally, due to their limited context, they are easy to share with others and thus commonly used within the context of crowdsourcing [3, 7, 8, 23]. More recently, research has begun to explore these in the context of personal productivity tasks [5, 29, 31, 32]. This research has suggested several benefits to this approach of work, such as increased quality and greater resiliency to interruptions when completed as a series, versus a single larger task [7].

In this paper we explore the use of microtasks in a casual setting, as a way to enable the productive use of the micromoments people have during the day [7]. In particular, we look at how people respond to having microtasks interleaved with non-work related activities. 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, 15, 29, 33]. This requires a conscious effort on the individual's part to choose to engage with the 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 to people while they are engaged in another 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 [22]. We explore casual microtasking in the context of Facebook, which is commonly used at work when an individual feels bored with their current task as a way to take a break or transition between tasks [26]. However, while a recent Pew Research report suggests workplace social media interactions are important, 56% of respondents also reported that social media distracts them from what they are supposed to be doing [17]. We look at how individuals engage with work-related microtasks during Facebook breaks, and how that engagement allows them to complete or return to meaningful activity.

To do this we extended an existing microtasking platform, *Play Write* [15], to show microwriting tasks in a person's Facebook news feed, as seen in Figure 1. We asked nine active Facebook users who edited documents as part of their job to use this extension for two weeks. Participants found casual microtasking to be an effective means to make progress on work during Facebook breaks. They were able to ignore the microtasks when they did not feel like engaging with work related activities, and typically completed microtasks after first interacting with the social content. They were particularly likely to microtask during the periods in the day associated with low-focus, and 20% of the time they launched Word after seeing the casual microtasks in their feed. This suggests that casual microtasks may be a good way for individuals to continue to feel productive when taking a break or transitioning from their primary task.

2 RELATED WORK

Microtasking is prevalent in crowdsourcing, in part because microtasks require limited context and allow crowd workers schedule flexibility [28]. While microtasking is traditionally associated with crowd work, the microtask structure can also

be beneficial to individuals [32], 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, 29, 31]. In general, breaking large macro-tasks 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 [16, 19]. 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 [13]. For example, systems like CrowdForge [20] and the MicroWriter [31] 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 [18] 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 microtasks are interleaved with other tasks and the completion of microtasks is often 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, Play Write [15] provides a mobile interface that allows users to edit their Word document from their mobile device via microtasks. Twitch [33] gives people microtasks to complete as part of their phone's unlock process, WearWrite [29] 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]. Other work has shown how vocabulary can be taught through microlearning experiences inserted in people's Facebook feed [21]. Conversely, some work has explored how to improve the quality of continuous microtasking by introducing entertaining "micro-diversions" [10].

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 [26], socializing, escape, distraction [1], and learning about coworkers [11]. Social media breaks can be useful, with social media use coinciding with low stress [27] and a positive mood at the end of the day [25]. However, research also shows an association between the time people spend on social networking sites and low effort thinking [35]. In this paper we build on previous research that shows microtask structure can help people complete complex tasks during free micromoments to

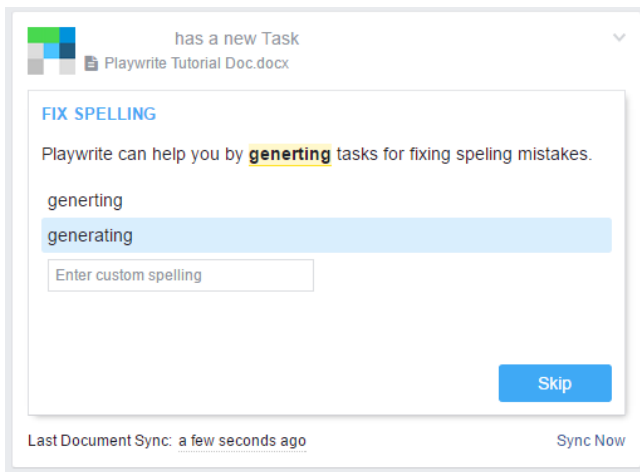


Figure 2: A spelling correction task card as it appeared in Facebook.

study the impact of providing people with writing microtasks during workplace Facebook use.

3 BUILDING MICROTASKS INTO FACEBOOK

We explore casual microtasking by extending an existing writing-centric microtasking system called *Play Write* [15]. *Play Write* consists of a plugin for Microsoft Word that extracts microtasks from Word documents and sends them to the cloud, where they can then be surfaced in different platforms using the Workflow engine component. While the *Play Write* microtasks have been studied in a laboratory setting as part of a standalone mobile experience [15], in this paper we look at Facebook as an alternative medium for surfacing and completing microwriting tasks.

We insert a person’s *Play Write* microtasks into their Facebook via a Chrome extension that interfaces with the *Play Write* workflow engine. When a user visits Facebook, the Chrome extension fetches microtasks belonging to the user’s documents from the cloud and integrates them into their news feed (Figure 1) as microtask cards (Figure 2). The Chrome extension implements seven of the different types of microtasks provided by the *Play Write* system:

- *Fix spelling* The user is shown the sentence with the error and asked to select the correct spelling from a list of alternatives.
- *Identify a wordy sentence* For verbose sentences, the user is shown the sentence and asked to reply to the question, “Is this wordy?”
- *Shorten a sentence* If a sentence is identified as wordy, the user is then shown several auto-generated shortened alternatives and asked to select their favorite.

- *Accept/reject a change* The user is shown a sentence containing a tracked change and asked to accept or reject it.
- *Triage a comment* A user categorized a comment by either acknowledging they have read it, deleting it, or indicating that it requires a response.
- *Reply to a comment* For comments that require a response, the user is asked to respond. This microtask surfaces immediately after the “Triage a comment” task.
- *Address a to-do comment* For comments that begin with the string ‘#todo,’ users are given the option to edit the referenced text while triaging the comment. This was a new type of task not present in the original *Play Write* system, which was included after some initial piloting.

Each microtask was designed to take only a few seconds to complete and was independent of the others. A new microtask card is shown every time the user scrolls 2000 pixels through their news feed, starting after the first 2000 pixels. Taking a cue from Facebook advertisements – which have strict design guidelines regarding aesthetic 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 the card if they did not want to complete any microtasks, much like they now scroll past ads. Additionally, if users were interested in doing work but did not like the available microtask they could easily request a new one using a large “skip” button. These two different actions – actively skipping versus scrolling past – provides signal as to whether a person wants to complete a microtask but is not interested in the one shown or to not engage with the microtasks 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 news feed. After the user is presented with 3 to 5 microtask cards in the same location they receive a positive affirmation, such as “You Rock”, while simultaneously 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 chooses to actively skip a microtask this deprioritizes the future display of microtasks of that type. When the user opens a Word document that has corresponding completed microtasks stored in the cloud, the Word add-in fetches the output of those microtask and modifies the document accordingly.

The screenshot shows a web browser window titled ': Survey'. The survey question is '1. * I am feeling ...'. Below the question is a 5-point Likert scale with the following labels: 'Not at all', 'A little', 'Somewhat', 'A fair amount', and 'Most Definitely'. There are four rows of response options: 'bored', 'frustrated', 'relaxed', and 'productive'. Each row has five radio buttons corresponding to the scale points. A 'Submit' button is located at the bottom left of the form.

	Not at all	A little	Somewhat	A fair amount	Most Definitely
bored	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
frustrated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
relaxed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
productive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

4 STUDYING CASUAL MICROTASKING

To study casual microtasking in Facebook, 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.

Six of the nine participants worked on at least two different documents for the study. These documents included engineering process documentation, onboarding information, research notes, conference papers, and progress reports. Participants noted that they were either the sole author of the document and were not at this stage collaborating with anyone, or they were the instigating author of the document, and sending it to another individual for review.

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, 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 news feed.

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.

5 UNDERSTANDING CASUAL MICROTASKING

Using this data, we examined how microtasks in Facebook impacted participants’ work experience. Specifically, we focused on if and when participants were microtasking, which microtasks they found useful, and how microtasking impacted their break time and ability to get back 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 task type. The simplest microtasks, designed to address spelling errors or identify verbose sentences, appeared the most. Others appeared less often. For example, shortened sentences are only shown following an affirmative reply to the “Is it wordy?” microtask, thus could only appear at most as often as that microtask was finished. Only two participants were working on collaboratively edited documents, making the total number of tracked changes and comment microtasks relatively low. To-do microtasks were the least likely to appear, as they require specialized syntax in the document (a ‘todo’ tag in a comment).

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 bimodally in mid-morning (10am to 11am) and in the afternoon (2pm to 5pm). This aligns closely with the pattern observed by Mark et al. [26] for focused attention, with focused periods tending to peak in mid-morning and mid-afternoon. Five of the nine 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.”

The Low Impact of Microtasks on the Facebook Experience.

Generally, the presence of microtasks did not appear to interfere with participants’ ability to browse Facebook for social purposes, and they found them easy to skip. For example, one participant said she, “Definitely ignored [the microtasks] at sometimes” when visiting Facebook, but “always felt that they were cool.” Only one participant specifically cited being annoyed by the microtasks in Facebook, saying they decreased the overall fun of Facebook for him.

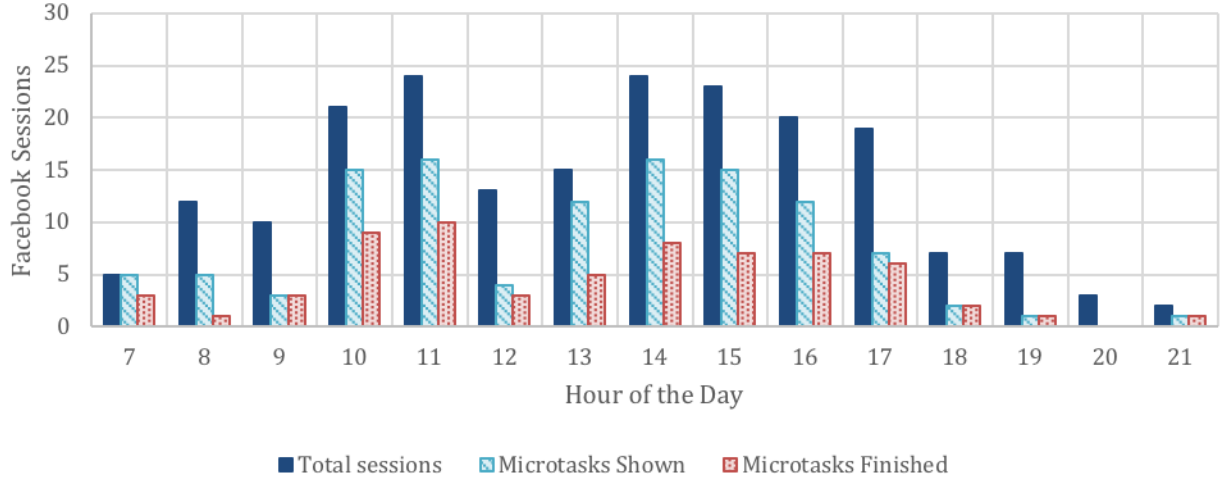


Figure 4: Breakdown of recorded Facebook sessions by time of day and whether a microtask was shown and finished.

Table 1: The number of microtasks, by task type, shown and completed during the two-week period.

	Tasks Shown	# Tasks Finished	% Tasks Finished	Docs 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

Doing Microtasks in Facebook

While participants only completed about 29% (129) of the total microtasks they were shown, for most (58%) sessions where a microtask was shown at least one microtask was completed. 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 actively brought up that they enjoyed 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.”

Easy or Actively Triggered Microtasks were More Readily Completed. Table 1 shows the microtasks that were shown and completed, broken down by task type. To-do, shorten, and comment are the three that were most likely to be completed

if 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.”

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.

Low priority documents were preferred as a source of microtasks. Participants also appeared to prefer to complete microtasks from documents that were of relatively low priority. The rationale they gave was that this allowed them to make progress on those documents by doing a few microtasks without engaging deeply. Instead of taking the time to open

Word, they were able to complete a few microtasks each day. As one participant said, “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 by 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.”

More Microtasks were Completed During Low Focus Periods.

As observed earlier, participants visited Facebook at work most in the mid-morning and mid-afternoon, which are times when focus typically peaks [26]. 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 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, there was some evidence that microtasks 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. This could either indicate that the microtasks didn’t encourage individuals to get back to work, or that passively having microtasks in Facebook could have encouraged the opening of word, independent and regardless of task completion, but that requires further study. In the interviews participants 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 [14] to break the chain of distraction.

6 DISCUSSION

Our results suggest that microtasks in Facebook provide an alternative way to accomplish meaningful work without a full context change to another task. This was especially useful for rote tasks that needed to be performed on a document i.e. fixing spelling mistakes, or working on low-priority documents. Most importantly, casual microtasking did not appear to ruin our participant’s Facebook experience, suggesting that as long as special attention is paid to the embedding and formatting of these tasks, they can effectively exist on the periphery of attention, and be readily ignored.

One of the most interesting and unexpected findings was the use of our “ToDo” tasks by one participant as a way to make progress on a low priority document consistently

throughout the two weeks. She introduced a custom scaffold of low-context tasks as a way to work on her document in pieces. While the current set of tasks are designed for more complete documents requiring refinement / editing, there is also another potential avenue of supporting document generation through microtask writing. Users could define a type of document, similar to a Word template, and then a set of microtasks could be generated based on that template and future microtasks completed.

However, while microtasks worked well in the above situations, they failed in other. Tasks that required a large amount of context, i.e. the track changes tasks, were largely ignored, and viewed as difficult to complete in a microtask setting. Additionally, unnecessarily verbose tasks, such as fixing spelling for proper nouns in a document, were viewed as frustrating. Further refining the types and extraction of tasks for microwriting so they are applicable and useful units of work is a natural next step for the work. Participants asked us to consider implementing a number of additional microtasks, including ones to expand content or fix formatting.

Limitations

As a result of the limited implementation, we also limited the scope and size of the study. Because this was a longitudinal field study on a prototype system, we limited participation to individuals who were easily reachable should they to encounter issues or bugs. Therefore, the population was fairly homogeneous and there wasn't a baseline for comparing the impact of these microtasks on features such as stress, total Facebook usage, and productivity. Additionally, the results were only evaluated in one microtasking context: Microwriting in Facebook. Due to these limitations, it is hard to draw any significant conclusions about how casual microtasking impacts work as a whole. While the results we achieved suggest that these tasks are non-invasive, easy to do, useful for users, and help them accomplish meaningful work, there could be some significant caveats based on the type of users, and where these tasks are being completed. Another field or deployment based study with a more heterogeneous population and pre-study logging would provide a more complete picture into the viability of these microtasks and their impact on productivity, stress and social media usage.

Lastly, given the number of participants in the study, we were not able to draw significant conclusions about a number of engagement metrics. By doing a larger deployment study in the future, we could perform A/B testing to understand the effects of some smaller interactions with the microtasks, such as number of posts to show before an initial task, how many tasks to show for best engagement, and if there is a proper or preferred order for presenting the microtasks, such as in [6].

Inserting Work into Non-Work Contexts

Additionally, it is important to fully understand the potential downsides of introducing work into a personal or relaxation context. Our participants commonly ignored the microtasks and did not appear to mind just scrolling past them, but further study is necessary explore the long term consequences to being constantly surrounded by work. It has the potential to increase stress and even introduce long term negative side effects on health, as has been observed with mobile notifications [30, 34].

While we inserted microtasks into Facebook only in work contexts, we asked participants about their desire to see them in other contexts. Two indicated that they would like a mobile Facebook version to get work done while “checking Facebook on my phone while fooling around. Or when I am on my bus —it would be nice to work on some of those smaller tasks.” However, one indicated that she would not be “ok with [seeing microtasks] on my phone. If I was out doing something, and there was a notification to ‘work on your document’ I would be mad.” She would only want them to appear when she was using Facebook to “find something to do.” Casual microtasking does not inherently have to be used to complete work tasks, and could also be used to help people complete personal tasks. These might be more appropriate to surface in personal contexts.

There is also the potential for casual microtasking to be exploited as way to demand additional work from workers. Alternatively, it could encourage organizations that currently block Facebook to allow its use given the increased likelihood that people might use it as a way to switch between tasks or work on a side task more fluidly. We are only just beginning to understand the long term impact of the blurring of the boundary between work tasks and personal activities.

7 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 lightweight 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 returning to productivity.

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