Micro Real-World Challenges to Tackle Zoom Fatigue

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Abstract

With the Covid-19 pandemic, the use of videoconferencing tools has massively increased. Yet, something about being in video conferences for a great amount of time makes us feel exhausted – this is how the term Zoom fatigue kicked in. One way to tackle Zoom fatigue is to take regular off-screen breaks in the surrounding physical world. However, people are often not motivated to leave their screens or need help knowing what to do during their breaks. To encourage breaking out of the digital tunnel, we developed a set of 67 specific, short, and atypical micro-challenges to combat post-Zoom fatigue. As an initial step, we validated the challenges' potential to provide a refreshing break and enjoyment within university lectures held via Zoom. We inform future work by categorizing the challenges with HCI experts.

CCS Concepts

• Human-centered computing \rightarrow Human computer interaction (HCI).

1 Introduction

During the Corona-19 pandemic, videoconference meetings replaced many procedures in the workplace, schools, or private social contacts. Most of these meetings were over Zoom due to the software's usability and availability. However, something about being on videoconference all day seems particularly exhausting, and the term "Zoom Fatigue" caught on quickly. Today, communication has shifted even further into the digital realm, and even post-pandemic, much communication will continue to take place digitally.

Reasons for Zoom fatigue can be sedentary behavior, similar to long working hours in front of the computer, but also exclusive issues such as staring at oneself or constant feeling of being starred (i.e., mirror anxiety [2, 8] and hyper gaze respectively [2, 8, 15]), the feeling of being physically trapped [7], or an increased amount of cognitive load from producing and interpreting nonverbal cues [12, 18]. Colloquially speaking, users feel rapped in a digital world. Thus, taking regular and refreshing breaks between or after meetings in the physical, surrounding world to tackle Zoom fatigue [8, 17]. Yet, users of digital tools have difficulties taking breaks, particularly breaks that are refreshing and re-balance users' physical and digital activities. Epstein et al. [5] showed that knowledge workers (who also spend a great amount of time bound to their computers) mostly



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engage in breaks that are again digital, such as checking email or visiting social media, or biological needs, such as going to the bathroom or getting a snack. Alternatively, a short, specific, and unfamiliar task might be exciting [6] and, thus, motivate the user to take a break by exploring their physical surroundings. Thus, we pose the following research questions:

RQ1 What are good micro-challenges, to be executed in the real world post experiencing Zoom fatigue?

RQ2 To what extent do the micro-challenges provide a refreshing break?

To answer these questions, we developed a videoconferencing chatbot that suggests small, real-world challenges after digital videoconference meetings. For this, we developed a set of 62 microchallenges for users to complete in the real world, post-Zoom fatigue. Following, we categorized and validated the ease of executing the challenges within an expert's focus group. We incorporated a subset of the challenges into a Discord chatbot, and tested their refreshment and enjoyment potential throughout three university lectures via Zoom. Overall, the chatbot was well received, and the challenges positively affected most participants' enjoyment and refreshment.

2 Related Work

Tiredness, anxiety, or worry are typical side effects of excessive use of videoconferencing platforms [10, 16]. Researchers and journalists name this phenomenon *Zoom fatigue* [16]. Although named after Zoom, it affects all video conferencing platforms. Here, In a recent study with 422 participants [15], approximately 60% of participants state experiencing Zoom fatigue, with 64.1% experiencing it strongly or very strongly [15]. Almost all participants experience some decline in mental well-being, such as decreased concentration, increased irritability, or lack of balance. Additionally, fatigue in a work context is higher than in a social context [7].

One of the most frequently mentioned tasks to tackle Zoom fatigue is to take short breaks after or between meetings [1, 8–10, 15, 16]. Taking a physical or mental break from the screen can be refreshing and can make people ready to work again [3]. The importance lies in off-screen breaks, though. Khan et al. [11] point to on-screen breaks not being as helpful in refreshing the user's body and mind. As such, they propose breaks mainly involving some kind of physical activity for on-screen jobs. Peper and Lin [13] found when students perform some physical activity for just a minute or change their posture to an upright one, they report significantly increased subjective energy and attention levels compared to a slouched posture. Additionally, Rogers [14] found their participants doing meditation breaks between Zoom meetings have their stress levels dropped between meetings .

What constitutes a good break is differently perceived among users [5]. However, the consensus is that users need to feel refreshed and ready to perform when they return from a successful break. Cobb and Poirier [4] described that small challenges can stimulate motivation and enjoyment. Specific challenges increase the willingness to engage with them [6]. So far, challenges have shown effectiveness in encouraging physical activity [4] or mindful eating [6].

3 Methodology

3.1 Challenges' Development & Validation

From an online user survey conducted within another project, with N=225 participants, we assembled user's current break practices to gather inspiration on the challenges. These practices included a variety of digital practices (Youtube, Twitch, emails, or general surfing the internet), necessities (making something to drink, eating something small, toilet break), movement practices (stretching, taking a walk outside), relaxational practices (rest eyes, shower, read a book) or organizational tasks (review/ prepare next meeting, cleaning/ housekeeping activities).

We followed the SMART approach for the challenges, so they are *Specific*, *Measurable*, *Achievable*, *Relevant*, and *Timely*¹. Both the first and second authors, in pairs and separately, iteratively developed the challenge set and cross-checked that they adhered to the *SMART* criteria, resulting in 62 challenges.

We then derived four categories from related work and the online survey: *movement*, *physical exercise*, *mindfulness*, and *creativity*. Additionally, we organized a workshop with six HCI experts from our research lab to assign the challenges to these categories and evaluate the ease of executing the challenge. The resulting categorization can be found in Appendix B (11 challenges are not being assigned to a category). Most challenges were rated to be easy to complete, except for those that included unavailable entities such as outdated technology or a pet (see Figure 1a).

3.2 Chatbot Implementation for our Field Study

To test the effectiveness of the micro, real-world challenges in providing refreshing and enjoyable short breaks, we implemented a chatbot called *Real-World Challenges* that suggests the developed challenges using JavaScript for Discord. Our initial intention was to create a chatbot for Zoom that automatically suggests challenges upon ending a Zoom meeting. However, we faced various security and compliance issues, which made us move the chatbot to Discord. As students from our university at the time of the pandemic used Discord extensively, this was a valid alternative.

We developed a working chatbot for the field study. The user requests a challenge by using the slash command <code>/newChallenge</code>, after which the chatbot suggests a random challenge from the challenges' pool. After executing a challenge, the user types <code>/answer</code> answer as response. The chatbot then allows the user to evaluate the challenge or see other people's answers. As previous research suggests <code>[6]</code>, we incorporated the latter for social comparison and curiosity, . The <code>/evaluation</code> command triggers the following four 5-point Likert-scale (from <code>strongly disagree</code> to <code>strongly agree</code>) questions:

- **E1** The challenge was difficult to complete.
- **E2** I enjoyed completing the challenge.
- **E3** I feel refreshed after completing the challenge.
- E4 I feel anxious after completing the challenge.

Finally, we asked participants for /feedback, which directs the user to an optional questionnaire that probes user's opinion on the challenges, the overall system and user's demographics. Figure 1b presents an exemplary interaction with the chatbot.

3.3 Field Study Procedure and Participants

We deployed the chatbot on our University's Discord server. In the first run, we tested the chatbot during a hybrid lecture that had two 15-min breaks between lecturing sessions. We presented the chatbot at the beginning of the first break and encouraged students to freely engage with it. We did not give any further instructions. In this run, the chatbot suggests one of ten different challenges (see the first ten entries in Appendix A).

Some participants received the same challenge multiple times, so we extended the challenges' pool with another ten challenges, for a total of twenty challenges in the pool (see Appendix A). In the second run, we tested the chatbot during a two-day course of Zoom presentations. Again during breaks between the Zoom sessions, we encouraged students to engage with the chatbot freely. The break's length was approximately ten minutes. Ten participants (m=7, f=3), aged 21 years on average (SD=3.38) filled out the feedback questionnaire.

4 Results

The analysis is based on a small set of answers, as not all participants filled out the sampling questions after completing a challenge. For example, although completed 8 times, C1 has only two complete answer sets. Moreover, challenges C11, C12, C13, C16, C19 and C20 have no answers recorded. With this in mind, we report the following results.

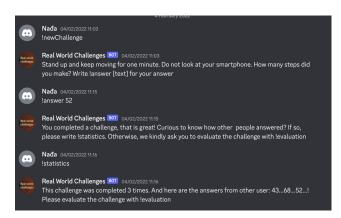
In total, students participants in the course completed 92 challenges, with five challenges being completed the maximum amount of 8 times. Most challenges in the study were rated as easy or very easy. Challenges C1, C2, C4, C15 and C18 (s. Appendix A) received at least one strongly agree or agree for being difficult to execute. The opinions on enjoyment were more diverse. 53% of the challenges were rated as enjoyable. More than half of the challenges evaluated (57%) were found to be refreshing (i.e., M > 2.5). The challenges that were rated as not enjoyable closely overlap with those rated as not refreshing. After each challenge, participants were asked to rate whether they feel anxious. This statement was not agreed to for any challenge. Either participants did not feel anxious before doing the challenge in the first place, or the challenges were able to improve their anxiety levels.

Positive qualitative statements report on challenges as being "diverse and fun" (P3) and "a nice gimmick" (P7). P1 praised the idea of "just taking some time off-screen when one is just staring at the screen all-day." 80% of the participants, who filled out the final questionnaire, stated they would use the chatbot if made widely available.

 $^{^{1}} https://www.mindtools.com/a4wo118/smart-goals\\$



(a) Experts' evaluation of the challenges.



(b) An exemplary interaction with the chatbot.

Figure 1: Insight from our field study.

5 Conclusion

This paper presents a set of 62 playful and SMART micro-challenges to tackle Zoom fatigue. We showed that these could motivate users to leave their digital screen after video conferencing to foster a refreshing and enjoyable off-screen break. Furthermore, we show that challenges must be enjoyable and refreshing (and vice-versa). More future work is needed to explore the influence of the categorization of challenges, users' preferences for the challenges, and the challenges' delivery timing to ensure greater engagement and user experience.

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A List of Challenges Used in Field Study

- (1) Go through the alphabet in reverse. How many mistakes did you make?
- (2) Get up and stretch your arms above your head. Try to be as tall as possible. Which item of furniture in your room matches your height while stretching?
- (3) Find 3 items and try to juggle them for 10 seconds. How many times did you drop them?
- (4) Find a piece of paper and a pencil and draw a small picture of an animal. What animal did you draw?
- (5) Dance to your favorite song. What song did you dance to?
- (6) Stand up and go to the closest window. Look into the distance for the thing that is farthest away from you. What do you see?

- (7) Stand up and keep moving for one minute. Do not look at your smartphone. How many steps did you make?
- (8) Stand up and look how far you can rotate to the left and then to the right, while your feet are stable. In which direction can you rotate more?
- (9) Sit back, take a sip of water, close your eyes and imagine something you are grateful for. What is it?
- (10) Mentally go to a place where you would like to spend your vacation. Think about a text for a postcard. What is on the front of the postcard?
- (11) Try to balance on your right leg as long as possible. How long did you make it?
- (12) Get up, stretch yourself, open a window and take a deep breath. What does the air smell like?
- (13) Get as far away as you can from your computer in the building you are in. How many steps is the computer away?
- (14) Get yourself something to drink, e.g. water or tea, and drink a few sips with your eyes closed. What does the liquid feel
- (15) Search for the most colorful item in the next room. How many colors are there?
- (16) Go outside and look at the sky. What did the form of the cloud remind you of?
- (17) Open the window identify three different sounds outside. What did you hear?
- (18) Try to hold a plank for as long as possible. How many seconds did you get?
- (19) Go around your place and find 5 objects with the color of your shirt. What objects did you find?
- (20) Find something small, like an eraser, throw it in the air and catch it. How long can you do that without dropping it?

B List of All Challenges by Category

- Exercise
- (1) Get up and stretch your arms above your head. Try to be as tall as possible. Which item of furniture in your room matches your height while stretching?
- (2) Find 3 items and try to juggle them for 10 seconds. How many times did you drop them?
- (3) Dance to your favorite song. What song did you dance to?
- (4) Stand up and keep moving for one minute. Do not look at your smartphone. How many steps did you make?
- (5) Stand up and look how far you can rotate to the left and then to the right, while your feet are stable. In which direction can you rotate more?
- (6) Try to balance on your right leg as long as possible. How long did you make it?
- (7) Get as far away as you can from your computer in the building you are in. How many steps is the computer away?
- (8) Search for the most colorful item in the next room. How many colors are there?
- (9) Go outside and look at the sky. What did the form of the cloud remind you of?
- (10) Try to hold a plank for as long as possible. How many seconds did you get?

- (11) Find something small, like an eraser, throw it in the air and catch it. How long can you do that without dropping it?
- (12) Stand up and do 10 jumping jacks. How is your hearth beating now?
- (13) Stand up and do 10 knee-bends. How is your hearth beating now?
- (14) Do 3 different stretching exercises. Which body parts did you stretch?
- (15) Grab a book/ newspaper/ article and read for 5 minutes. How many pages did you read?
- (16) Find a CD, and turn on the first song of that CD. What memories did this song bring back?
- (17) Go and find your pet. Engage with him. If you don't have a pet, find a stuffed animal and cuddle it. What kind of (stuffed) animal did you engage with?
- Movement
- (1) Get up and stretch your arms above your head. Try to be as tall as possible. Which item of furniture in your room matches your height while stretching?
- (2) Find 3 items and try to juggle them for 10 seconds. How many times did you drop them?
- (3) Dance to your favorite song. What song did you dance to?
- (4) Stand up and keep moving for one minute. Do not look at your smartphone. How many steps did you make?
- (5) Stand up and look how far you can rotate to the left and then to the right, while your feet are stable. In which direction can you rotate more?
- (6) Get as far away as you can from your computer in the building you are in. How many steps is the computer away?
- (7) Search for the most colorful item in the next room. How many colors are there?
- (8) Go outside and look at the sky. What did the form of the cloud remind you of?
- (9) Go around your place and find 5 objects with the color of your shirt. What objects did you find?
- (10) Stand up, leave the room, close the door. How many doors can you see?
- (11) Go around your place and find your favorite object. What is it?
- (12) Go outside and take a picture of something red. What did you take a picture of?
- (13) Walk around and ask the next person you see what they are doing. What do they do?
- (14) Stand up and pick 3 items that need to be cleaned and clean them. How dirty are they?
- (15) Do 3 different stretching exercises. Which body parts did you stretch?
- (16) Go to the other side of the room with as few steps as possible. How many steps did you take?
- (17) Go to the other side of the room with as many steps as possible. How many steps did you take?
- (18) Look around your room. Find items that are orange. How many items did you find?
- (19) Grab a book/ newspaper/ article and read for 5 minutes. How many pages did you read?

- (20) Grab any book that you can find and read page 10, what is the last word of the page?
- (21) Find a CD, and turn on the first song of that CD. What memories did this song bring back?
- (22) Go and find your pet. Engage with him. If you don't have a pet, find a stuffed animal and cuddle it. What kind of (stuffed) animal did you engage with?

• Mindful

- (1) Sit back, take a sip of water, close your eyes and imagine something you are grateful for. What is it?
- (2) Mentally go to a place where you would like to spend your vacation. Think about a text for a postcard. What is on the front of the postcard?
- (3) Get up, stretch yourself, open a window and take a deep breath. What does the air smell like?
- (4) Get yourself something to drink, e.g. water or tea, and drink a few sips with your eyes closed. What does the liquid feel like?
- (5) Open the window identify three different sounds outside. What did you hear?
- (6) Go around your place and find your favorite object. What is it?
- (7) Go outside and take a picture of something red. What did you take a picture of?
- (8) Close your eyes and think of something yellow. What do you see?
- (9) Go into every room in your place and name the object you recognize first. What was the third object?
- (10) Stand up and pick 3 items that need to be cleaned and clean them. How dirty are they?
- (11) Look outside your window and find an animal. What animal do you see?
- (12) Go to the other side of the room with as few steps as possible. How many steps did you take?
- (13) Think about your last vacation. What did you enjoy most?
- (14) Think about today. What made you happy?
- (15) Call a friend of yours and have a little chat. What is the third sentence they have said?
- (16) Find 3 items around you that bring you joy. What are they?
- (17) Open the window and take a look outside. Name out loud 5 things you can see, 4 things you can hear, 3 things you can physically feel, 2 things you can smell, and 1 thing that you can be grateful for today. What did you smell?
- (18) Grab a book/ newspaper/ article and read for 5 minutes. How many pages did you read?
- (19) Close your eyes and think of the following question: What would you long for right now?
- (20) Get up, close your eyes and imagine being in your favorite spot in nature. Breathe deeply. What do you hear?
- (21) In the meeting, did you wonder, how one specific person was doing? If appropriate, write them a short message asking how they are. Did you write a message?
- (22) Mentally go to a place where you would like to spend your vacation. Think about a text for a postcard. What would you write on this postcard?
- (23) Remember the last situation where you laughed really loud. What was that situation?

- (24) Go and find your pet. Engage with him. If you don't have a pet, find a stuffed animal and cuddle it. What kind of (stuffed) animal did you engage with?
- (25) Set a timer for 2 minutes and look out the window. Count the birds you can see. How many birds did you see?

Creative

- (1) Find a piece of paper and a pencil and draw a small picture of an animal. What animal did you draw?
- (2) Dance to your favorite song. What song did you dance to?
- (3) Mentally go to a place where you would like to spend your vacation. Think about a text for a postcard. What is on the front of the postcard?
- (4) Go around your place and find your favorite object. What is it?
- (5) Go outside and take a picture of something red. What did you take a picture of?
- (6) Close your eyes and think of something yellow. What do you see?
- (7) Walk around your next room and find 4 items that are blue. What items did you find?
- (8) Think about your last vacation. What did you enjoy most?
- (9) Think about today. What made you happy?
- (10) Find 3 items around you that bring you joy. What are they?
- (11) Close your eyes and think of the following question: What would you long for right now?
- (12) Get up, close your eyes and imagine being in your favorite spot in nature. Breathe deeply. What do you hear?
- (13) In the meeting, did you wonder, how one specific person was doing? If appropriate, write them a short message asking how they are. Did you write a message?
- (14) Think about your favorite animal. Write a short poem for it. What is the poem about?
- (15) Mentally go to a place where you would like to spend your vacation. Think about a text for a postcard. What would you write on this postcard?
- (16) Imagine you can invent a new fantasy animal. What would it look like and what sounds does it make?
- (17) Draw a picture of a fruit-man. Which fruit did you choose and what was his special feature?

• no category

- (1) Go through the alphabet in reverse. How many mistakes did you make?
- (2) Stand up and go to the closest window. Look into the distance for the thing that is farthest away from you. What do you see?
- (3) Look around your room. Which was the last book/article/newspaper that you read?
- (4) Stand up and count the mugs in your cupboard how many are there?
- (5) Find 3 objects that are triangular. What is the smallest object?
- (6) Go to your fridge, open it and look at the top shelf. What do you see first?
- (7) Go into your kitchen and look for spoons. How many spoons did you find?
- (8) Go outside and check if there is any item in your mailbox. How many items are there?

- (9) Think about what your favorite fruit is. Which dish with this fruit do you like to eat the most?
- (10) Try the bottle flip challenge. Fill a bottle 1/3 full with water, close the bottle and try to throw it onto the table so that it remains standing. How many attempts did you need?
- (11) Think of a video game you liked to play. Try to remember as many characters as possible. How many names do you remember and which game did you think of?