

Zooming in: making the most of video technology in an increasingly virtual world

Nathan C. Sheffield^{1,2,✉}

¹Center for Public Health Genomics, University of Virginia

²Departments of Public Health Sciences, Biomedical Engineering, and Biochemistry and Molecular Genetics, University of Virginia

✉ Correspondence: nsheffield@virginia.edu

<http://databio.org/zooming-in>

The pandemic has changed the way we communicate drastically. Video conferencing has replaced so many of our in-person meetings. Zoom reported usage increased from 10 million participants before the pandemic to more than 300 million monthly participants.

At first, it was easy to think that things will “soon get back to normal,” and people tried to cobble together virtual solutions just to make the most vital things work. As it became clear that it could be this way for a long time, more and more things moved into virtual formats. Now after almost a year of “lock-down”, the vast majority of our professional interactions are virtual. Many experts agree that the pandemic will change the way we interact even after it becomes safe to again meet in person – and probably even permanently. Some things may never become in-person again. The world has simply discovered that, while video conferencing has many weaknesses and frustrations, it also has an enormous number of benefits. Like it or not, increased video conferencing is here to stay.

You can choose to respond to this in one of two ways: You can “zoom out” – protest against the very real loss that virtual meetings has caused, and try to minimize and avoid as many zoom events as you can, only attending the most vital things. Or, you can “zoom in” – adapt to the technology, try to emphasize its strengths and minimize its weaknesses. Doing the latter is making the most of an opportunity – because it is an opportunity to connect with people from all over the world more cheaply and easily than has ever been possible before. We should embrace this and use it to its fullest potential. We can do that by making a few subtle behavioral and technological changes in the way we approach our virtual meetings.

Over the past year, I’ve participated in hundreds of video calls. My typical month now includes dozens of recurring or ad hoc zoom meetings. I participate on multiple global working groups that use video conferencing as a primary means of communication. In addition, I’ve organized multi-day virtual hackathons and attended or helped organize multiple virtual conferences that brought together people from 5 different continents. While I don’t consider myself an expert, I have noticed that by spending ./buildvirtual meetings of different

types, I’ve learned a few things about what can make these experiences more effective. The purpose of this document is to share some simple ideas to improve the quality of our video interactions.

My purpose is two-fold. First, I’m trying to combat zoom fatigue. If you’ve ever sat in video calls for an 8 hour day, at the end of it you may find yourself thinking, “I did nothing but sit there all day long, and I’m exhausted”. There are a lot of little things that add up to create this feeling, known as ‘zoom fatigue’ but I think it’s possible to reduce it. Second, I’m trying to increase zoom productivity. I’ve found enormous variation in the way virtual meetings are organized and run. Of course, some in-person meetings are more productive than others as well, but I think the rules are different for virtual meetings. I hope to provide some ideas to both improve your own virtual productivity and reduce your fatigue.

I organized this into a list of 6 suggestions. These points address address both technology and behavioral issues. In technology, I’ll present some ideas on software and hardware choices (microphones, cameras, and lighting). For behavioral issues, I’ll give some observations on how to run meetings and encourage contributions, and how to be an engaged participant.

Suggestion 1: Get a professional microphone

The single biggest frustration I have with virtual meetings is with poor-quality audio, usually caused by poor-quality microphones. It’s frustrating to me because it’s so easily preventable, and so widespread. There is an enormous difference between a professional-quality microphone and a low-end built-in laptop or webcam mic. In a virtual call, when visual and environmental cues are weakened, we rely even more on audio – and it’s very mentally taxing to listen to low-quality audio for long periods of time. I don’t blame people for using poor quality mics, though – what makes this problem so insidious is that people almost never have a chance to listen to *themselves* talk. Even people who do lots of virtual meetings likely never realize what they sound like to others. After a few months of zoom meetings it finally dawned on me that some of the people I met regularly were much easier to understand than others. At that point, I decided to do a thorough investigation, and I recorded myself in a zoom meeting speaking into 5 or 6

different microphones, including a laptop mic, webcams in different price ranges, a headset, and a professional mic. I was blown away by the difference. While it may not matter much for a short call, or an infrequent meeting, when you're doing so many virtual calls in a day, the microphone really starts to matter. It requires so much more concentration to listen intently to someone who is using a poor microphone. I believe poor microphones are a major cause of zoom fatigue. So, if you can encourage those you communicate with frequently to upgrade their microphones, and of course consider upgrading yours, you can make zoom much more productive.

So, I challenge you to record yourself in a zoom room with your microphone, and compare it to how I sound on [this recording where I demonstrate a variety of different microphones](#).

Suggestion 2: Be aware of your lighting and surroundings for video

In a similar vein, but in my opinion drastically less important than the microphone, is the issue of visuals. Video is important, yes – but not as important as audio. Nevertheless, we also communicate through visuals, so it's easier to connect and communicate with cameras activated than without them; you can gauge reactions and sense nonverbal cues that way. There are a number of common issues here; one is lighting, another is camera quality, a third is camera angle, and a fourth is camera view. But given that video takes up so much more internet bandwidth, and is so much less important for communication than audio, I'd argue that your camera is a minor issue compared to your microphone. Nevertheless, if you want to get the most of frequent virtual meetings, figure out a way to eliminate distractions from your background, use dedicated lighting to ensure that you're visible, and use a decent quality camera that you can position and angle appropriately. Some of the common issues I observe are: cameras that are pointed off to the side, so the person's face is only half-shown; cameras that are mounted to view the person from an unnatural angle; poor lighting so that it looks like you're communicating with a shadow; or grainy images from poor-quality cameras. If you want to take virtual meetings seriously, you want them to be as close as possible to in-person communication. The way to do that is by putting in a bit of thought and preparation. All of those issues are easily solvable with a little bit of preparation and maybe a few more dollars.

Another related issue is the debate of turning cameras on or off. This is tricky one and I don't think there's one answer, because it depends on the situation. I argue that in a small group, it's nice when everyone agrees to turn cameras on, because it signifies engagement. However, there are clear exceptions to the rule. I also find that once a zoom conversation hits a certain number of people, it just stops making sense for everyone have cameras

on unless they are talking, because it provides distractions and can contribute to zoom fatigue.

Suggestion 3: Encourage active engagement in meetings

I noticed early on that it was much harder to get people to participate in a virtual meeting than it is an in-person meeting. Virtual meetings have got three major problems that feed off one another to reduce engagement of participants: First, it's much easier to get away with not paying attention; second, there's much more immediate availability of distractions, since you're by definition sitting at your computer/device; and third, everyone's immediate environment is different. These add up to certain disaster for participant engagement. The zoom meeting environment just makes it so easy to check out. How do we mitigate this?

As a meeting facilitator, make sure you're calling on specific people to participate regularly. This is a perfect manifestation of the classic issue of the bystander effect. If you just ask questions to a crowd, most people will simply never speak up. And because zoom makes it feel even easier to melt away, that is multiplied. So, therefore, it's even more important to call directly on people to encourage discussion. Some of the most effective meetings I've been in have been ones where the organizer specifically calls on each person in turn to ask for any comments. In an in-person meeting, this is less necessary, as quiet people seem more willing to speak up. Keeping cameras on can also help with this, though it may have other consequences. For smaller meetings (as in, a dozen or fewer attendees), I try to greet everyone by name when they arrive. In this way, I'm sort of acknowledging that they're there, and I think this encourages engagement.

As a participant, there are also some things you can do to make sure you stay engaged despite how easy it is to check out. You just have to be aware that if you do nothing, you'll get distracted. So, turn off other notifications like slack or e-mail. Make a conscious effort to stay engaged. Use "speaker view" so that you're not distracted by other participant's videos. You can also help the facilitator out by referring to and asking for input from other attendees, particularly quiet ones.

The engagement problem is less pronounced in 2- or 3-person meetings, so it's clearly a reflection of how many people are in the room. So, another strategy is to reduce the size of the meeting. I've noticed that the more people there are in a meeting, the less engaged the participants tend to be. I think a sweet spot for engaging meetings is somewhere around 4-8 participants. If your meeting gets too much larger than that, it's really easy for some members to go through the entire meeting without unmuting.

One good way to keep people on the same page, literally, is to use a shared agenda. I've found that using a

shared google doc with an agenda can help keep people engaged, because it provides a collectively viewed visual that is both interactive and shared, which is not the same as a typical screen share.

Suggestion 4: Leave space

I've been in many zoom meetings that seem to be dominated by just one or a few participants. Often, it's the facilitator, who seems to just talk and talk and talk, and never gives a pause to allow anyone else to say anything. I've thought about this a lot as I observe the behavior, and I think can at least partially explain why this seems more common in virtual meetings.

One thing about Zoom is that the ability to interject is decreased. There's just a slight delay in audio, possibly coupled with the need to unmute, and this is just enough barrier that it makes it hard to interject when someone is monologuing. In real life, during a very short pause or a breath, it's possible to jump in and complete a sentence or make a quick comment, which opens the floor – but this is not possible in a virtual meeting due to that split-second delay. This makes it harder than normal to derail loquacious people. Unfortunately, it seems many people don't realize this. My advice is that participants, and particularly facilitators, must make sure to *leave space*. After every few sentences, pause. Don't be afraid of 5 seconds of silence. I've been in meetings that I give up ever trying to say anything because the facilitator or enthusiastic participants will never leave any room.

If you, like me, seem to have a natural tendency to fill any space up with words if given the chance, then it takes a dedicated effort to suppress that in a virtual meeting. The solution to this is to choose your words carefully; state your point and then stop. This is good advice all the time, but it's particularly important in a virtual setting.

Suggestion 5: Take a break

One of the advantages of virtual meetings is the reduced "passage cost" – the time it takes people to move from one meeting to another for in-person meetings. With in-person meetings, even with meetings in the same location, there's an understood cost of a few minutes to transition as some participants leave and others arrive. Because that cost is so much smaller with zoom, it's easy for people to assume it goes away entirely – but the truth is, it doesn't. There's time it takes to find links, make sure your audio and camera settings are correct, orient windows on your machine – and so it can actually take a few minutes with zoom.

But if you don't acknowledge this, you'll find yourself booking meetings that abut. Early on with zoom, I found

myself scheduling meetings that would go from 2-3, and 3-4, and then 4-5. I think this is common. My experience with these back-to-back-to-back-to-back zoom meetings is that there's something useful that happens in that unscheduled downtime that disappears with this approach. With back-to-back virtual meetings, I didn't have that downtime, and I think this is a major contributor to zoom fatigue. I believe this feeling arises at least partly due to the combination of a lack of any physical movement at all – not even to switch rooms – coupled with the increase in mental focus required because of no planned or unplanned downtime.

Exacerbating this issue is the tendency I've noticed for virtual meetings to go past their scheduled end time. We all see this tendency with in-person meetings, too, but it's less frequent to schedule in-person meetings back-to-back, since you acknowledge the required transition time. What this means is that ending on time is probably even more critical with virtual meetings. Yet, somehow, it seems more acceptable for virtual meetings to go past the scheduled end. It's almost as if everyone thinks, "I know you're not going anywhere. You're still going to be sitting right there in that chair after you log out, so we can go another minute or two." But that's the behavior that leads to zoom fatigue.

The solution to this problem is to change the way we schedule things. Instead of taking advantage of the reduced passage cost to plan virtual meetings back-to-back, we need to give a 5 or 10 minute grace period on either end of the meeting. This both provides a bit of a break to recharge between mental engagement, and also puts some padding to solve for things like messing with audio settings.

Suggestion 6: Think outside the zoom box

There are a lot of other virtual technologies that can be using instead of, or along with, zoom. Often the most effective and fun meetings are one that include other systems of interaction. For example, Slido is a Q&A polling application that can be used to allow people to ask questions, and then upvote other people's questions to prioritize things. I've seen this used effectively to poll feedback from users in large groups. Many meetings I participate in use a shared google doc or HedgeDoc to allow all participants to be editing notes or brainstorm in real time. There are also alternative video tools like Wonder, Spatial.chat, and Gather Town, which add a spatial element to meetings that can be really effective for some types of meetings. I've found that these kind of spatial encourage random interactions with people that don't happen in the more formal setting of the traditional room-like video tools like Zoom or Skype.