Title Page

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Research Note

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“Zoom Developmentalists”: Home-Based Videoconferencing Developmental Research during COVID-19

Abstract

As home-based video conferencing has become increasingly popular among developmental researchers during the COVID-19 pandemic, there is a pressing need to discuss its potentials and challenges. We have augmented our own experiences with insights from many “Zoom developmentalists” (see Acknowledgments) to provide recommendations for those who are considering engaging in home-based videoconferencing studies.

Keywords

- Online Research
- Developmental Science
- Zoom
- Videoconferencing
- COVID-19
- Qualitative Research

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Main Document

The practice of online research is becoming normative among developmental scientists, during the ongoing COVID-19 pandemic (Sheskin et al., 2020; Rhodes et al., 2020; Gnanavel et al., 2020). With the advancement of videoconferencing technology (Hanna, 2012; Janghorban et al., 2014; Deakin and Wakefield, 2014; Howlett, 2021; Reñosa et al., 2021) and the shutdown of laboratories, daycare centers, schools, and museums, researchers worldwide have shifted their in-person studies to virtual ones while often working from home (Archibald et al., 2019; Berman, 2020; Wood, 2020; Lourenco and Tasimi, 2020; Chennerville and Schwartz-Mette, 2020). While scientists are embracing technology to conduct their developmental research during lockdowns, this new modality is not yet optimal and mature. Here we survey thirty-six developmental researchers who have been executing home-based videoconferencing studies in the past year with a five-question questionnaire from late-November 2020 to early-March, 2021 about their experiences conducting developmental research online. We describe the strengths and weaknesses of practicing developmental science in this new era.

The Bright Side of the New Normal: Home-Based Videoconferencing Developmental Research's Sweet Spots and Its Derivative Benefits

In online moderated experiments, synchronous communications powered by leading technology are the crux of experimenter-child interactions. Below are summaries from a broad cross-section of experimental developmentalists about the unparalleled advantages of using videoconferencing software in developmental studies.

- **Flexible Time and Space:** Home-based online research relaxes experimenters and experimentees because it overcomes hurdles created by traffic difficulties (e.g., time,

energy, and expenses) (Janghorban et al., 2014; Deakin and Wakefield, 2014). For parents of infants and young children, a home-based interaction relieves carers' burdens and inherently encourages participation.

- **Diversified Participant Pool:** For many scholars, especially those based in small college towns or suburban areas, remote participant recruitment significantly increases and diversifies the child participant pool without noticeably increasing costs. Such a benefit may be specifically helpful to those interested in investigating cross-cultural and multilingual topics, which usually present challenges recruiting a sufficient number of eligible participants.
- **Smart Tools:** Videoconferencing communication technology provides practical tools for researchers. Embedded recording substantially decreases participants' social desirability because the recording signals (e.g., blinking red dots on a camera) are less noticeable than a traditional audio/video-recorder between/around the talkers. Live closed captioning facilitates conversation by displaying simultaneous visual language cues, which researchers report can greatly expedite the post-experiment transcription process. The host's autonomy to mute/unmute attendees and enable/disable webcams is useful to control audio and visual distractors. For paired (e.g., mother-child) and group tasks, the breakout room allows uninterrupted discussions outside the perception of other participants. In terms of repeated sessions, the fixed and exclusive invitation link aids the returning task-takers to locate the meetings quickly and lowers drop-out rates. Designs like share-screen and remote-control reduce miscommunications and promote clarity. Functions such as chatbox are useful because they enable both parties to send/receive multi-format information by sharing/uploading external links, word descriptions,

photos/pictures, video clips, and files. Surprisingly, most researchers in our sample report that intermittent video/audio quality (e.g., internet disconnections) are not the most significant concerns because pre-meeting preparations (e.g., handouts, checklists) and in-meeting breaks and clarifications can mitigate such issues.

- **Fair ecological validity:** Home-based environments enable researchers to easily observe natural intrafamilial interactions and can better capture unaffected family dynamics.

The Stumbling Blocks: Hidden Concerns of Home-Based Videoconferencing

Developmental Research

While developmental researchers utilize synchronous communication-tools-mediated-sessions to connect with their participants under stay-at-home circumstances, they have reported some common concerns.

- **Lack of Controlled Environments:** Physical surroundings such as background noise and distractors vary across families and might interrupt participants' perception of researchers' instructions and research materials (e.g., to-be-remembered videos); such intrusions may be more common in certain sociodemographic groups, thus posing potential interpretative challenges. Also, researchers have reported that non-invited family members, including parents, siblings, and pets, occasionally interrupt the conversation flow and can be distracting.
- **Short Attention Span:** Child participants' attention spans are shortened during online sessions. Developmental researchers need to reduce the length of sessions (with a recommendation of no more than 30 minutes), and intersperse game-like elements in research materials to keep children interested. Also, as there is usually a tradeoff between

the screen viewing distance and the viewing resolution, it is hard for young children to sit still in a goldilocks position and keep staring at the screen throughout the experiment.

The lack of physical control makes it more difficult for researchers to track their participants when they physically leave the webcam vision.

- **Over-Reliance on Parents:** Unlike traditional laboratory-based research, at-home developmental research sessions heavily rely on parents' active involvement in order to engage children in the focal task (e.g., operate computers and the internet) and complete tasks (e.g., press buttons; point directions). Thus, it is almost impossible to prevent parents from implicitly—and sometimes explicitly--influencing their children throughout the research process.
- **Limited Nonverbal Communications:** Nonverbal behavioral cues are limited because videoconference attendees can usually only see each others' upper body with moderate video resolution. Therefore, it is challenging to test participants with whole-body psychomotor and motion tasks or topics focusing on facial (micro)expressions.
- **More No-Shows and Withdrawals:** Unwanted absence of virtual visits, even though it can be reduced by sending friendly reminders via email or text in advance, is still unavoidable, according to some developmentalists.
- **The “Zoom Fatigue” Phenomenon** (Wiederhold, 2020; Bailenson, 2021; Pepper et al., 2021): The exhaustion and stress caused by overusing virtual forms of communications is a real threat for children, especially those who are very young (and likewise for the very old). Fatigue makes participants require more frequent and prolonged breaks during online sessions than is the case with in-person experiments. According to some respondents, this phenomenon also depletes experimenters' cognitive capacities because

most research teams arrange multiple sessions within a relatively short period, which might be acceptable in in-person settings but energy-taxing in online scenarios.

- **The Visible Self:** Participants, especially young children, are easily distracted by webcams as they can see themselves throughout the online experiments, which is unusual during in-person conversations. Such mirror-like synchronous reflections embedded in videoconferenced discussions might cause concerns when conducting experiments that involve self concept and body image.
- **Multitasking Experimenters:** Requirements and burdens on experimenters become higher and heavier in online sessions. Many developmental laboratories have reported that they formerly arranged a mixed team of postgraduate, graduate, and undergraduate researchers for a single experimental session in the pre-pandemic era. For instance, “greeters” welcome parents and child participants to the lab; “caretakers” play with children and infants before the session starts; observers/notetakers/timers/synchronous coders might watch/code/time/take notes during the session through a one-way mirror from an adjacent room; experimenters would interact with participants with research materials; and others might be assigned to debrief/reward child participants and their parents after the session ends. In contrast, during experimental videoconferencing sessions these people cannot all show up on the screen simultaneously, or the dynamic might become unnerving to participants. One common way that was suggested to lessen this perceived stress is to avoid multiple researchers. In such cases, the online experimenters need to be proficient in every stage of the experimentation. They are often the senior members (e.g., PI, graduate students) who have experience conducting similar sessions in-person. Because they need to play multiple roles throughout the online

meetings, they become quickly exhausted after administering one session. Hence, project directors report requiring more time to train and rehearse with experimenters before conducting online studies.

- **All-Virtual Research Materials:** In many current online cognitive-developmental studies, researchers replace their stimuli and rewards from real-life objects (e.g., real stickers) with animated images (e.g., e-stickers). Even though participants of a very young age can understand the meaning and significance of these digital proxies, there is insufficient evidence to examine whether they exert an effect that is equivalent to real objects. More, in 2-D-screen-mediated meetings, the difference between a synchronous conversation (e.g., a live researcher) and a pre-recorded video (e.g., an actor in a research video) becomes vague, which might obscure distinctions between fantasy and reality for young children.
- **Lack of “Researchness”:** Some developmentalists express the concern that the sense of remoteness that inheres in online studies might weaken researchers’ authority or dilute an experiment’s perceived seriousness, which might create a discrepancy between the an online chatroom versus an in-person environment (e.g., formalities of research institutes, laboratories). For instance, even when researchers wear the same professional attire as in the laboratory or when visiting homes, schools, and museums, their apparel is less perceptible when online because much of their attire is unseen by the child. The experimental procedure’s diminished officiality might disincentivize participants from consistent engagement as the excitement of participation in research fades when a scientific study (e.g., play an online game; talk to an adult) looks the same as a routine daily life event during pandemic.

- **“Recruitment Competition”:** While participants can conveniently get access to multiple online developmental projects at the same time, they tend to attend to those that offer the most attractive compensation. Thus, the global competition for child participants has forced researchers to increase incentives compared to in-person versions of the same study. For instance, one research group gave child participants stickers for in-school interviews; however, they offered \$10 Online Gift Cards for the same study during the pandemic.
- **Potentially-Skewed Participant Pool:** Lourenco and Tasimi (2020) have sounded the alarm that there could be a selection bias toward child participants during COVID-19 who happen to be supported by available parents and have adequate home environments for online experimental sessions. Unlike pre-pandemic developmental research, most of which was supported by teachers and conducted in public places such as schools, museums, and local community centers, pandemic-related home-based child research heavily relies on the availability of not only the invited children but their parents and their parent’s computer. Children living with parents who work from home--primarily skilled white-collar workers--are more likely to sign-up to participate in remote studies during COVID-19. Most online developmental research requires child participants to equip themselves with stable internet/WiFi bandwidth and digital communication devices such as headsets and microphones, which might be less attainable for low-income families. One of the researchers we surveyed reported that her research required that participants had access to dual monitors, resulting in a skewed distribution of participants’ socioeconomic statuses. Hence, home-based videoconferencing research sessions might

not bridge a growing divide between the poorer and the wealthier children in terms of equal access to participation in a science project.

Concluding Remarks: At the Point of No Return, Embrace the Chaos and Move Forward

Although the developmentalists we surveyed expressed a diversity of views toward web-mediated studies, most of them reached a consensus that internet-based developmental research is, inevitably, an emerging avenue to conduct developmental research, one that they believe will continue long after the pandemic. As there is a steep learning curve to shift developmental studies online from scratch, collaborations between scholars need to be fostered and encouraged. An integrative cross-laboratory nexus aiming at building an online-developmental-research-friendly environment, such as current endeavors (e.g., ChildrenHelpingScience, Global Kids Online (Stoilova et al., 2016), Lookit (Scott and Schulz, 2017) and planned endeavors (e.g., CRADLE; see Sheskin et al., 2020), is of the essence. Distinct from counterparts who work with standard adult populations, developmental scientists, instead of adapting themselves into the current online behavioral research realm designed for adults, need technology tailored for targeted age groups.

In sum, though still in its infancy, online developmental science appears to be in the throes of a scientific methodology revolution equivalent to that of the current crowdsourcing platforms (e.g., MTurk; see Chmielewski and Kucker, 2020; Jensen-Doss et al., 2021). It will be interesting to monitor this ongoing quantum methodological change for its impact on the type of research that developmentalists conduct long after the pandemic ends.

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