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## **MATCHING DIGITAL INTERVENTION AFFORDANCES WITH TASKS: THE CASE OF ZOOM AND WHATSAPP MENTAL HEALTH INTERVENTION FOR SENIORS DURING THE COVID-19 PANDEMIC**

Daphna Yeshua-Katz  
Ben-Gurion University of the Negev

Stav Shapira  
Ben-Gurion University of the Negev

Limor Aharonson-Daniel  
Ben-Gurion University of the Negev

A. Mark Clarfield  
Ben-Gurion University of the Negev, McGill University

Orly Sarid  
Ben-Gurion University of the Negev

### **Background**

During the first COVID-19 wave, we conducted a Zoom and WhatsApp digital group intervention that promoted community-dwelling older individuals' mental health. Following the intervention's implementation, in this study we placed the intervention in the context of media richness theory (MRT) (Daft & Lengel, 1986; Rice, 1992) and affordances framework (Evans et al., 2017; Gibson, 1977; Rains, 2018) to explore the roles of the technological affordances and constraints of the video-conferencing app Zoom and the instant-messaging app WhatsApp in the intervention performance.

Media richness theory (MRT) is a framework used to describe a communication medium's ability to reproduce the information sent over it (Daft & Lengel, 1986; Rice, 1992). Communication transactions that can clarify ambiguous issues to enhance understanding promptly are considered *information-rich*. Communication transactions that require a long time to enable understanding or that cannot overcome different

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perspectives are *lower* in richness or are *information lean*. Central to MRT is the proposition that tasks vary with respect to specific characteristics. Perrow (1967) originally proposed and described task analyzability as a basic task characteristic. *Task analyzability* refers to the way that individuals can respond to problems that arise in the process of task completion. *Analyzable* tasks are those for which predetermined responses to potential issues, and well-known procedures, are available and useful, because outcomes are well understood. In contrast, *unanalyzable* tasks require individuals to think about, create, or find satisfactory solutions to problems outside of the domain of facts, rules, or procedures (Rice, 1992).

We examined performance through the perspectives of the group moderators, technical support members, and principal investigators, and addressed the following research questions:

- Research question 1: How did Zoom and WhatsApp affordances match (un)analyzable intervention tasks and contribute to the intervention performance?
- Research question 2: How did Zoom and WhatsApp constraints restrict (un)analyzable intervention tasks and hinder intervention performance?

Based on the media richness theory (MRT) and affordances approach, in this study we used netnography to explore how Zoom and WhatsApp technological affordances/constraints matched intervention tasks and increased intervention performance.

## **Findings**

This section identifies four key Zoom and WhatsApp affordances – temporality, interactivity, multimediality, and portability – which we identified through observation during the intervention period and via moderators' perceptions. We examined these affordances in the context of MRT by examining the ways in which the 1) communication channel affordances matched the 2) intervention's (un)analyzable tasks to enhance the 3) intervention performance. See intervention's media richness assessment in Table 1.

Table 1: Intervention's affordances and media richness assessment

Communication channel	Media affordance	Task Characteristic	Feature used	Intervention performance
Zoom	Temporality ↓	Teaching techniques (UA)	Video chatting	✓ Learning simple tasks ✓ Focused and ephemeral communication
WhatsApp	Temporality ↑	Scheduling meetings Pre- and Post-measures of well-being (A)	Sending text messages with links	✓ Group management tool ✓ Ongoing communication ✓ Socialization
Zoom	Interactivity ↑	Building safe space & intimacy (UA)	Gallery view "Mute-all"	✓ Synch. communication ✓ Connectedness × Information load
WhatsApp	Interactivity ↑	Problem-solving (A and UA)	Text messages, link sharing, & WhatsApp video calls	✓ Emergency channel ✓ Technical support ✓ Socialization
Zoom	Multimediality ↑	Teaching techniques (UA)	Screen share	✓ Learning simple tasks
WhatsApp	Multimediality ↑	Improve digital literacy Teaching techniques (UA)	Sharing image, audio, & video files	✓ Conducting intervention in a personal setting
Zoom	Portability ↓	Group interaction (UA)	Small Screen size Interface	× Limited presence × Distress × Physically demanding
WhatsApp	Portability ↑	Practice techniques in safe spaces (UA)	Taking pictures & videos	✓ Practicing techniques individually ✓ Location independence

Note:

↑ = High; ↓ = Low

A = Analyzable text; UA = Unanalyzable task

✓ = Affords; X = Constrains

## **Temporality**

Zoom and WhatsApp differed in their temporality, a term used to refer to how digital interaction over time is experienced by individual users, and how that influences the overall use pattern and experiences (Huang & Stolterman, 2011). The moderators indicated the ways in which Zoom offered an ephemeral and focused window of time to deliver unanalyzable tasks such as leading group sessions. WhatsApp, for its part, helped maintain a co-presence that enhanced the unanalyzable task of social interaction and enabled moderators to support the Zoom meetings by stretching the interactions beyond specific meetings.

## **Interactivity**

The second affordance that was important for delivering a remote intervention was interactivity, defined as the interaction-generating functions of the digital app's interface (Sundar, 2009), including the ability to comment, meta-voice, provide feedback, and engage (Evans et al., 2017). Zoom's rich media environment of video conferencing offers high interactivity, which enables the completion of unanalyzable tasks using synchronous communication between moderators and seniors, and among the seniors themselves. WhatsApp appears to offer an optimal solution for both analyzable and unanalyzable tasks supporting group and interpersonal interaction.

## **Multimediality**

WhatsApp's and Zoom's multimediality, defined as the vast array of multimedia functions including voice and video calls, and the exchange of pictures, emojis, and audio and video messages (Schrock, 2015), enabled moderators and the research team's technical support people to take advantage of this information-rich media environment to reduce uncertainty and ambiguity during the intervention.

## **Portability**

Out of all of the affordances we identified, the portability affordance of seniors' devices—defined as the ability to transport a device/app and to use it regardless of one's location (Schrock, 2015) – at times enabled but also constrained the unanalyzable task of creating group interaction by increasing uncertainty among the seniors and limiting their co-presence.

Empirically, our study identified specific affordances and constraints associated with the intervention. Theoretically, our study extends previous MRT work by expanding it with an affordance framework. In particular, our study approached MRT media characteristics through the affordances approach. It examined how the match between media affordance range (high vs. low) and intervention task (un)analyzability contributed to the intervention's performance. Hence, this study contributes to the field by deepening our understanding of how the variability of digital affordances (the range between low and high levels of temporality, interactivity, multimediality, and portability) might contribute to the performance of the intervention task. The match between the four affordances and task analyzability also provides a deeper understanding of

affordance as a relational construct in the interplay between technological objects and outcomes. As such, this study lays the grounds for further testing the relation between affordance types and levels and task analyzability in future studies.

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