

A Communicability Test for Evaluating Team Communication

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Introduction

Effective team communication is essential for mission success in many complex operational environments. Many tools have been developed to evaluate interactive team communication. A recent example is the collaborative “Blackjack” communicability task (van Wijngaarden, Smeele, & Steeneken, 2001), designed for two-person teams. In the present study, we set out to develop a reliable method for testing how a degraded communication transmission channel can impact communication effectiveness in a larger team and in any number of conditions. This procedure, known as the “Interactive Team Dialogue Effectiveness” (ITDE) task, measured communication effectiveness in terms of the time necessary for the team to reach a consensus about the proper ordering of unfamiliar images that were viewed in randomized order.

Method

ITDE Task

The ITDE is a computerized task allowing flexibility for repeated trials in a variety of conditions. Each of four team members is seated in front of a computer that displays a five-column interface. The columns, identified by color labels, contained four images of human faces that were randomly selected for each trial. The same two columns appeared to all team members, and each team member had one column in common with each of the other three members. Images were randomly ordered within columns. The object of the task was for members with the same column of images to place the images within that column in the same order. Dependant variables were task completion time and accuracy with which the task was completed. Prior to data collection, subjects were trained to ensure familiarity with the task.

Communication Environment

The ITDE task relies on communication, so variations in communications quality were expected to directly impact the time required to complete the task. Five different communication environments of decreasing quality were examined. The fullest amount of interaction was in the Face-to-Face condition, where members sat facing one

another around a table and could communicate with each other verbally and visually. In the Cubicle condition, members sat in a row of office cubicles in the same room, allowing them to hear one another but preventing them from seeing each other. The last three conditions all involved scenarios where the members were located in different rooms and could only communicate via one of three communications channels: A commercial telephone Conference Call on a standard handset telephone; a four-way Voice-over-IP (VoIP) teleconference incorporating a propagation delay of approximately one second; and a four-way internet Chat session (communicating via typed messages).

Results and Discussion

The results in Table 1 show the predicted increase in completion time as a result of the decreasing quality of the communication links between team members in the five different communications environments examined.

The ITDE task seems to be a valid objective tool to assess communications effectiveness in collaborative team tasks, as it produced a clear difference in performance across all of the communications environments tested.

Table 1: Results.

Communication Environment	Mean time (s)	Score
(1) Face-to-Face	97.1	140.6
(2) Cubicle	106.2	144.0
(3) Conference Call	119.3	142.4
(4) VoIP	212.1	139.8
(5) Chat	426.8	135.4

Acknowledgments

Thanks to Alex Kordik, Brian Simpson, Nandini Iyer, Sander van Wijngaarden, Frank Mobley, and Dianne Popik.

References

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