

Camera Angle Affects Dominance in Video-Mediated Communication

Wei Huang, Judith S. Olson, Gary M. Olson

Collaboratory for Research on Electronic Work (CREW)

School of Information

University of Michigan

Ann Arbor, MI 48109-1234, USA

+1 734-615-6639

{huangwei, jsolson, gmo}@umich.edu

ABSTRACT

Physical proximity and appearance guide people to interact with each other in different ways [1,6]. However, in Video-Mediated Communication (VMC), these are distorted in various ways. Monitors and camera zooms make people *look* close or far, monitors and camera angles can be high or low making people *look* tall or short, volume can be loud or soft, making people *sound* assertive or submissive, --all independent of the true physical characteristics or intentions of the participants. Here we test the apparent height of a person on how dominant they are in a group decision-making task. We found that the artificially tall people had more influence in the group decision than the artificially short people.

Keywords

Proximity, camera angle, VMC, distance, dominance, influence, height

INTRODUCTION

Proxemics is the name of the field of study of how behavior changes as a function of the physical arrangement of people [6]. For example, conversation has a different style when participants are physically close to each other than if they are not. Distant people speak in more formal, longer sentences, as if pronouncing to a group in public speaking. Those closer have a more casual, interrupted style, with a swifter negotiation of common ground. Technology can distort these distances. When participants are remote, the distance of the monitor from the viewer, the camera zoom setting and the monitor placement can determine the *apparent* distance one is from the remote

person.

Grayson & Coventry [4] examined the conversational patterns of pairs of people where the monitor was either close or far from the participant, and the camera either zoomed in or out from the face. Interestingly, the results showed that it was not the size of the person's image on the retina that changed behavior from formal to more informal, but rather the relative size of the face on the screen. In essence, the viewer assumes the psychological position of the camera, with zoomed in views being interpreted as physically closer.

There are other features of the presentation of the remote person that can potentially have an effect on behavior. For example, by placing the monitor and camera artificially high or low, one can give the impression that the remote person is either taller or shorter than they are. A person looking up all the time (with the remote person apparently looking down) may feel submissive; the artificially tall person could feel dominant. The psychological literature suggests that tall people are significantly more powerful and successful than short [3]. In film and video production, the dominant effects are often generated using different camera angles. Low angle shots are used to make the person appear tall, dominant and powerful while high angle shots are used to make the person appear short, weak and submissive [4]. As VMC resembles film/video production at large, it is critical to know whether the perspective angle generated by the placement of camera leads to the dominance/submissive effect.

In this laboratory study, we have dyads interact through a VMC system while engaged in a group decision-making task. We set the camera angle and monitor high in one room and low in another to simulate a situation where a 'short' person is talking to a 'tall' person. We wanted to see whether the 'tall' person is more influential than his 'short' partner.

EXPERIMENT

Design

The study is a between subject design with camera angle: high vs. low [-/+30]. The screen size was 14". The distance of the user from the monitor and camera is 4 feet. Figure 1 shows the high and low camera/monitor setup.



Figure 1. Subjects with high and low monitors.

Participants

Twenty-eight pairs of subjects were run. To control the impact of gender, age, race and status, we recruited only white American males, 19-28 years old. Participants were strangers before they entered the study.

Procedure

The participants were randomly assigned to two rooms with the camera/monitor pre-setup. They were asked to fill out a pre-test questionnaire to collect demographic data such as height, age, year in school and experience using audio-video communication technology. Questions to assess the dominance of the participants (adapted from [2]) were also included in the pre-test questionnaire. The participants were instructed to work on a problem privately and then negotiate a common solution through VMC. Each participant completed the ranking of the items he thought he should keep after a crashed landing in an arctic area (the Arctic Survival task). They then were to come to a common ranking collectively, talking through the VMC. They were encouraged to be persuasive and reasonable as they discussed with their partner. They were motivated through a reward if their final solution was close to that of the expert. After the negotiation, they filled out a post-test scale to assess the effectiveness of the technology, their perceived influence on the final decision, their own dominance, and the perceived dominance of their partner.

Measure of influence

The influence was measured as the sum of absolute differences between the individual ranking and team ranking. The larger the difference, the less his influence was judged to be.

RESULTS AND DISCUSSION

The pre-test questionnaire revealed that the baseline of dominance of the subjects in the artificially tall and short condition is equivalent ($F(1,54)=0.024$, n.s.). We assume that any differences in influence between 'tall' and 'short' individuals cannot be attributed to their baseline dominance.

Individual influence on group decision-making was analyzed between 'tall' and 'short' groups. We found that 'tall' people are significantly more influential than are their 'short' peers ($F(1,54)=4.229$, $p<0.05$). Consistent with the influence measure from the task, the post-test scale reveals that 'tall' people think they are slightly more influential than their 'short' partners ($Mean_{tall}=55\%$, $Mean_{short}=50.3\%$, $F(1,54)=2.86$, $p=0.097$).

These results are important, not only for understanding people's behavior through technology distortions, but also for the practical world. Physical placement of video cameras, zoom angles and monitor distance can distort people's perceptions of closeness and height. These factors affect behavior in both conversation and decision-making. In our experience those who set up video conferencing have not been especially sensitive to such issues.

A number of other variables, such as the distance of the monitor or the volume of sound, are potentially important, and are being examined in ongoing research on this topic.

ACKNOWLEDGEMENTS

This work was supported in part by a grant from the NSF, IIS 9977923 to the Olsons at CREW.

REFERENCE

1. Argyle, M. and Dean H. "Eye-contact, distance and affiliation." *Sociometry* 1965, 38(3) pp289-304.
2. Burgoon, J. K., Johnson, M. L., & Koch, P. T., The Nature and Measurement of Interpersonal Dominance. *Communication Monographs*, 65, 1998.
3. Ellis, L., The high and the mighty among man and beast: How universal is the relationship between height (or body size) and social status? *Social Stratification and Socioeconomic Inequality*. L. Ellis. Westport, CT,
4. Giannetti, L. D. *Understanding movies*. Upper Saddle River, N.J.: Prentice Hall, c1999
5. Grayson, D. & Coventry, L., The effects of visual proxemic information in video mediated communication. *SIGCHI'98 Bulletin*. 1998, 30(3) pp. 30-39.
6. Hall, E. T. *The hidden dimension*. Garden City, NY, Doubleday & Company, Inc. 1966.