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The Detrimental Effect of Phone Interruptions on Complex Task Performance

Intrusions also referred to as social interruptions, involve human actors. Human actors, who serve as the catalyst for intrusions, can interrupt the flow and continuity of an individual's work and bring that work to a temporary halt (Adamczyk and Bailey, 2004). Social interruptions can be disruptive, but they are a necessary part of organizational communication.

Studies drawing on empirical evidence and establishing theoretical frameworks to describe specifically the effect of social interruptions on primary task performance remain scarce. There has been little consensus and only a small amount of theoretical progress (Hodgetts and Jones, 2006). However, theories about the related phenomenon known as social facilitation abound (Aiello and Douthitt, 2001).

Zajonc revolutionized social facilitation theory by finding that the "mere presence" of others enhances dominant responses (responses where the tendency is for the correct response to be "dominant") by increasing the individual's level of general "drive" (later referred to more often as arousal), but impairs subordinate responses (Zajonc, 1965). Recent studies have challenged the way presence has been defined and expanded social facilitation findings to include electronic presence (Aiello and Kolb, 1995). It has been suggested that presence be viewed not as a dichotomous variable, but as a continuous variable differing on the salience of presence (Feinberg and Aiello, 2006).

According to media richness theory, "richness" is operationalized as the number of communication channels or cues available in media. Face-to-face is the richest (most salient) medium, a telephone is an intermediate richness medium, and computer-mediated communication is an example of communication using a "lean" medium (Daft et al., 1987; Daft and Lengel, 1986, Daft and Lengel, 1984). We predicted intrusions of varying saliencies would have different effects on performance. For example, social interruptions consisting of intrusions initiated in different mediums vary in salience and therefore would be expected to differ in their effects. Zajonc (1965) theorized that presence impairs subordinate responses (responses typical of a complex task). It was hypothesized that interruptions occurring in the most salient medium, face-to-face communication would impair complex task performance the most.

This study expanded social facilitation theory, specifically distraction-conflict theory, into the domain of communication mediums. Prior to this study, only a flawed study by, Storch (1992), has examined the effects of social interruptions occurring in different mediums. The purpose of this study was twofold. One goal was to broaden the literature on distraction-conflict theory to reflect this differential impact of distractions in different communication mediums. The other was while broadening the literature, to generate results that are very applicable to managers in the workplace whose employees deal with a great deal of distractions on a daily basis.

Method and Procedure:

Seventy-three students enrolled in General Psychology courses at a major Northeastern University participated in the study as part of their course requirements. Participants included 34 males and 39 females. Thirty-eight of the participants were Caucasian, nine were African-American, three were Hispanic, 16 were Asian, and seven were other.

Individuals were randomly assigned to 6 conditions. The participants were assigned to either interruption

or non-interruption conditions. Participants were further assigned to conditions corresponding to one of three communication mediums: Face-to-Face, Phone, and Communication via Instant Message. All participants completed a payroll (complex) task similar to those completed by human resources employees. During the task, a confederate interrupted the participants assigned to interruption conditions. Depending on the medium to which they were assigned, participants were interrupted by face-to-face visitors, by telephone, or via instant message. The participants who were in non-interruption conditions were also contacted by IM, by phone, or in person as well, depending on the condition to which they were assigned. However, these control participants were contacted after completing their primary task rather than while executing their primary task.

Results and Discussion:

Performance on the payroll task was divided into three categories: speed, accuracy, and net speed (combining speed and accuracy). Surprisingly, in contrast to what was hypothesized, the face to face interruption (the interruption in the most salient medium) did not disrupt individuals most during the complex (payroll) task. There was a significant main effect for condition for number of items correct on the complex task $F(3,72)=3.639, p<.05$ as well as net speed $F(3,72)=4.316, p<.05$ (See Table 1). Individuals who were interrupted by in-person visitors were not significantly more impaired than non-interruption participants. Post-hoc (Tukey) tests showed that only participants interrupted by phone performed significantly slower and significantly less accurately than individuals who were not interrupted. Furthermore, there were significant correlations between overall state anxiety levels after the payroll session and payroll gross speed ($r=-.25, p<.05$) as well as net speed ($r=-.29, p<.05$). Thus, payroll session performance diminished as individual's stress related arousal increased.

It was surprising that the phone interruption impaired participants more on the complex task than the face-to-face interruption delivered in a more salient medium. One explanation for the strong complex task impairment caused by the phone interruption is that the participants perceived phone communication with a confederate as more urgent and novel than communicating in person or via computer. It has been shown in previous studies that the unique position of the phone on the richness continuum, as compared to face-to-face and computer mediated communication, can lead to some more extreme attributes to phone communication (Glushakow and Aiello, 2006; Connell, Mendelsohn, Robins and Canny, 2001). The effects described here are an example of that. More information is needed to greater understand this phenomenon. However, the results of this study are useful for corporations such as Microsoft, who are in the beginning stages of developing attention-aware systems to help manage interruptions.