Contents lists available at SciVerse ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Media multitasking between two conversational tasks

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ARTICLE INFO

ABSTRACT

Communication multitasking was examined in three conditions: IM conversation with one partner, two IM conversations at the same time, and IM and phone conversation at the same time. Participants in the multitasking conditions reported higher task demand and a small loss in task performance was evident. Single-task partners assigned to a task the required discussion and deliberation preferred to interact with the multitasking participant via phone, rather than IM. But interactions via phone with one partner led to poorer assessment by a second partner who was shortchanged during the interaction. Multitasking participants who were focused on helping both partners seemed blind to these perceived differences by their single-task partners. The results suggest a strategic model of multitasking, with IM being the preferred choice for tasks that require fewer, shorter exchanges and voice being the preferred choice for tasks that required more discussion and deliberation.

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1. Introduction

In the current media landscape, individuals, particularly the youth, routinely use different media concurrently (Carrier, Cheever, Rosen, Benitez, & Chang, 2009; Kaiser Family Foundation, 2005; Papper, Holmes, & Popovich, 2004; Papper, Holmes, Popovich, & Bloxham, 2005). This emerging behavioral trend of combining multiple media tasks has been termed *media multitasking* (Srivastava, 2010; Wang et al., 2012). According to a report from the Kaiser Family Foundation, the proportion of time spent on media multitasking out of the time spent on media use increased from 16% in 1999 to 29% in 2009 (Rideout, Foehr, & Roberts, 2010).

The negative influence of media multitasking on task performance has been examined in various contexts, from classroom education to entertainment (Bergen, Grimes, & Potter, 2005; Pool, Koolstra, & van der voort, 2003), and the focus has been on the role of media as a distractor, such as in listening to music while doing homework (Hembrook & Gay, 2003) or listening to podcasts while browsing a website (Srivastava, 2010). In this study, however, we focus on mediated interpersonal interactions in single or dual-task scenarios. First, we examine interactions in which a multitasking participant is engaged in two text conversations at the same time.

Second, we examine interactions in which a multitasking participant is involved in voice and text conversations at the same time. The potential to combine voice and text is widely promoted by makers of smart phones, which is the impetus for examining multitasking via voice and text at the same time.

One of the frequently used channels of interpersonal communication among youth is Message Service (SMS), commonly referred to as texting, or Instant Messenger (IM). IM and texting are popular among youth (Carrier et al., 2009; Srivastava, 2010; Wang et al., 2012) and it is not uncommon for users of these new communication options to pursue multiple conversations at the same time. Each conversation is pursued in a different window and such multi-conversational scenarios raise questions about the quality of communication. For example, if an individual is collaborating with different partners via separate chat windows, does it affect task performance, perceived demand of the task, and task satisfaction? Also, might there be differences in perceived quality of the interaction between the multitasking individual and his or her single-task partners? Further, when more than one conversation is in progress, are two simultaneous text conversations less demanding than simultaneous text and voice conversations? These questions are addressed in a study by examining the performance of student participants assigned to single- or dual-task situations.

2. Multitasking and theoretical perspectives

Doing more than one task at a time, such as listening to music while attending to household chores or washing dishes while

talking on the telephone, predates the advent of the Internet and digital media. However, digital mobile technologies have made multitasking more accessible, available and manageable, in turn altering norms and mores about how we use media to communicate with colleagues, family, and friends.

Multitasking is influenced by various motivations. A common motivation is *efficiency* or the desire to manage multiple tasks and to optimize the process or time to complete tasks (Burgess, 2000; Carlson & Sohn, 2000; Lee & Taatgen, 2002; Meyer & Kieras, 1997). Another motivation is *enjoyment* from doing multiple activities (Wang & Tchernev, 2012), such as listening to music when chatting with friends on Facebook. Yet another reason for multitasking may be the desire to take advantage of the possibilities and affordances available through mobile communication technologies (Gibson, 1977; Norman, 1988).

Given these different motivations, various definitions of multitasking have been advanced. In this study, we adopt the following definition of multitasking derived from threaded cognition: "ability to integrate, interleave, and perform multiple tasks and/or component subtasks of a larger complex task," (Salvucci, Kushleyeva, & Lee, 2004, p. 267). Using this conceptualization, each conversation in communication multitasking can be modeled as a separate thread that is suspended and reinitiated a number of times over the course of an interaction. Although individuals may pursue many tasks or conversations simultaneously, higher level tasks such as communication can be accomplished only one at a time because of bottlenecks in cognition (Pashler, 1999). However, rapid switching between tasks may create an illusion of simultaneous processing, when in fact the underlying process may involve suspension of one task to attend to another. Evidence for such task switching has been found in functional magnetic resonance imaging (fMRI) studies (Knutson, Wood, & Grafman, 2004). But switching between two or more tasks in rapid succession requires strategic allocation of limited resources, which in turn hurts performance (Rubinstein, Meyer, & Evans, 2001).

2.1. Limited capacity theory

Resources available for multitasking are limited by the finiteness or limited capacity of human processing (Lang, 1995; Lang, 2000). When the cumulative demand from multiple tasks exceeds available resources, deterioration in task performance follows. Various studies have demonstrated a detrimental effect of multitasking on task performance in a wide range of settings, such as watching television news with news crawls (Bergen et al., 2005), doing homework while watching television (Pool et al., 2003), attending classes while using laptops (Hembrook & Gay, 2003), and listening to a podcast while reading online stories (Srivastava, 2010). Therefore, the first hypothesis is based on evidence from these studies that have tested limited capacity.

H1a. Task performance will be poorer in the multitasking condition than in the single-task condition.

H1b. Perceived task demand will be greater in the multitasking condition than in the single-task condition.

2.2. Multiple resource theory

While limited capacity theory posits a common pool of resources, *multiple resource theory* (Basil, 1994; Wickens, 2002) offers specialized resource pools that serve specific perceptual and cognitive mechanisms. When a task combination involves competition for similar resources, resource bottlenecks occur, resulting in

inevitable deterioration in task performance. For example, when multitasking involves listening to two audio messages simultaneously or reading two passages of text in real time, severe loss in performance can be expected because the tasks compete for the same aural and visual resources respectively. On the other hand, reading while listening to music requires visual and aural resources and the impact of multitasking may be less severe. In keeping with predictions from multiple resource theory, Srivastava (2010) found browsing the Internet or texting while listening to music were common, whereas media combinations that competed for the same perceptual resource, such as listening to music when watching television were rare.

2.3. Social norms of media use

Media multitasking is also influenced by media expectancy or schemas about normative use of new media. It is customary, for instance, to switch between conversations in texting or IM and participants in these interactions are not surprised by delays from divided attention. On the other hand, voice requires immediate and full attention, thus leaving little time for the IM thread. Although voice (vocal + aural) and IM (visual + motor) conversations tap different perceptual resources and according to multiple resource theory should be less demanding than two IM conversations competing for the same resources, social norms for voice conversations may neutralize this benefit. In short, from a social norm perspective, IM + IM may be less demanding than IM + voice, whereas from a multiple resource theory perspective, IM + voice may be less demanding than IM + IM. The following research question is advanced to examine these two competing perspectives.

RQ1: Are two concurrent IM conversations more demanding than concurrent IM and voice conversations?

3. Self-other differences in multitasking

In some multitasking situations, one of the participants may be involved in multitasking whereas conversational partners may be devoted fully to this interaction. This discrepancy in task demand can lead to self-other differences, which can be explained through *attribution theory* (Heider, 1958) and different reference points from which an actor and an observer conduct their evaluations (Jones & Nisbet, 1972). Various studies have demonstrated robust self-serving positive evaluation of self in the face of less flattering evaluation by others (Ehrlinger, Gilovich, & Ross, 2005; Jones & Nisbet, 1972; Pronin, Gilovich, & Ross, 2004). Individuals are typically more aware of their own situational factors and therefore demonstrate a propensity to attribute their behaviors to situational factors. Observers, on the other hand, who are unaware of the individual's situational constraints, tend to attribute the behavior of the individual to dispositions or personal qualities.

Extending this logic to the multitasking situation leads to the prediction that the multitasking participant may attribute his or her poor task performance to high task demand, whereas a single-task partner may attribute the multitasking participant's poor performance to lack of interest, effort or motivation. While the multitasking participant is likely to take into account the situational challenges of multiple tasks when evaluating own performance, a single-task collaborator who is unaware of the predicament of the multitasking individual may offer harsher assessments.

H2. Self-assessment by a multi-tasking participant will be more positive than the assessment by his or her task partner who is assigned to a single task.