

The effects of party line communication on flight task performance

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Abstract

Cognitive streaming is an approach to human information processing that regards short-term memory as a series of cognitive processes rather than stores. The approach is used as the theoretical basis for a series of experiments, both laboratory and simulator based, that assessed the disruptive effects of the party line on flight task performance. Initial laboratory work using a computer-based visual monitoring task, a communication task and a conflict detection task demonstrated that meaningful background speech was more disruptive to performance than meaningless reversed background speech or quiet. Moreover, the negative effect of the party line was further substantiated in a more realistic flight simulator study involving eight pilots: The party line condition resulted in a greater deviation from the touchdown point on the runway, and was associated with self reports of increased distraction and workload. Furthermore, an increase in flight checklist completion time was observed when background radio/telephony (R/T) was present, and also slightly more air traffic control (ATC) calls were missed or queried in this condition. The current theme of work extends laboratory findings on the 'irrelevant sound effect' to the aviation domain, and suggests that background sound in the party line not only adds to pilot workload but may also impair flight task mental activities.

Introduction

Background sound disrupts performance on a number of laboratory-based short-term memory tasks such as serial recall (e.g., Jones et al., 1992; 1995), text comprehension (Oswald et al., 2000) and proof reading (Jones et al., 1990). The goal of the current work is to extend these findings to the aviation domain by investigating whether the presence of background speech in the party line may be disruptive to short-term memory elements of flight task performance. Modular approaches to cognition such as multiple resource theory (Wickens, 1992) would suggest that background sound should only be disruptive to those tasks that draw upon the same capacity-limited resource (i.e., a concurrent auditory-verbal task, but