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Task-(Un)Specific Effects of Temporal Preparation

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Introduction

Temporal preparation usually results in enhanced performance in a variety of tasks. We investigated to what extent temporal preparation involves increased readiness for task-specific processing requirements as opposed to increases in task-independent readiness.

Method

Thirty participants performed either a visual or an auditory 2-alternative forced choice discrimination task within a variable foreperiod paradigm (see Figure 1). In trials with presentation of a visual response signal, participants were asked to press a key with their left hand's middle (index) finger as soon as the letter "S" ("X") was presented. In trials with presentation of an auditory response signal, participants were asked to push forward (pull back) the slider with their right hand as soon as the high pitched (low pitched) pure tone was presented. In separate blocks of trials, the presentation of tasks was either blocked or randomly varied.

Prediction

In principle, task-specific temporal preparation should have larger effects with blocked than with varied presentation of tasks.

Results

We observed the standard foreperiod effect: mean RT decreased with increasing foreperiod duration (see Figures 2 and 3). Furthermore, mean RT was shorter with blocked than with varied task presentation. In addition, we observed a sequential foreperiod effect: the standard foreperiod effect was larger when foreperiod duration on Trial n-1 was long as compared to when it was short. Neither the standard foreperiod effect nor the sequential foreperiod effect were significantly influenced by the type of task presentation.

Conclusion

The results replicated the standard foreperiod effect as well as the sequential foreperiod effect observed in previous studies. However, both effects were at least as large when presentation of tasks was randomly varied as when it was blocked, contrary to the idea of task-specific temporal preparation. Thus, our results favor accounts of the foreperiod effect according to which this effect reflects increases in task-independent readiness.

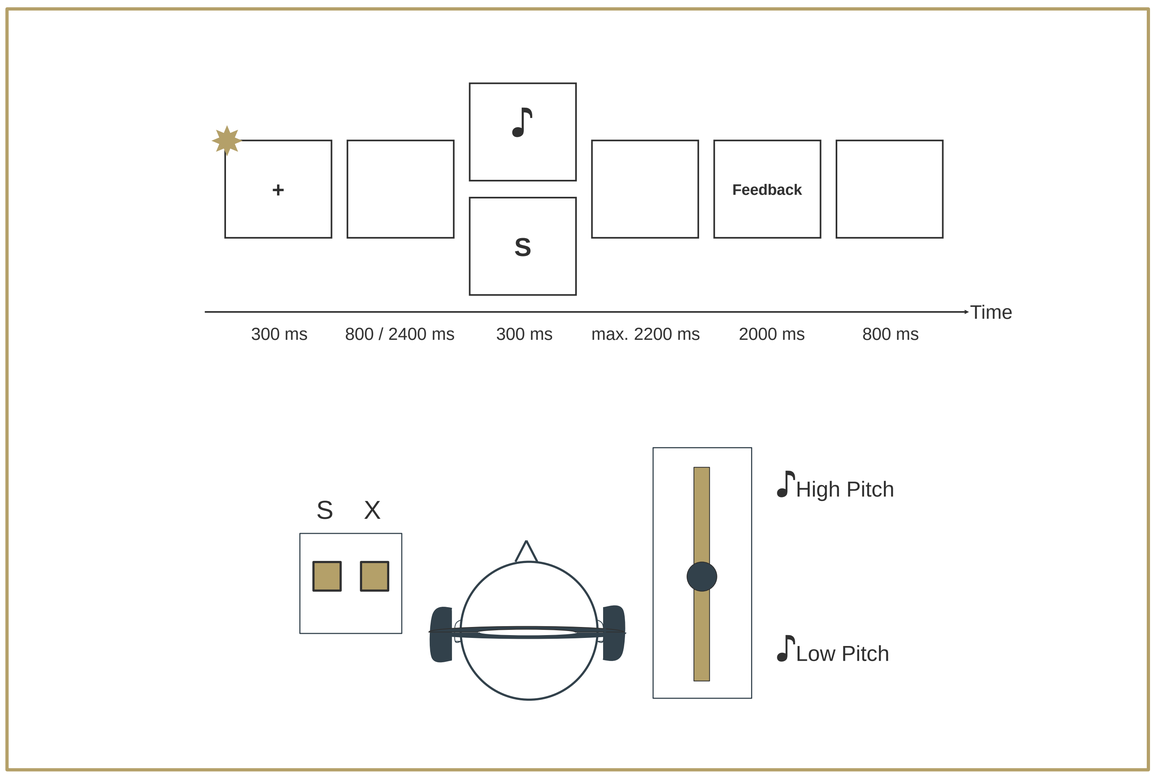

Figure 1: Trial scheme and experimental setup

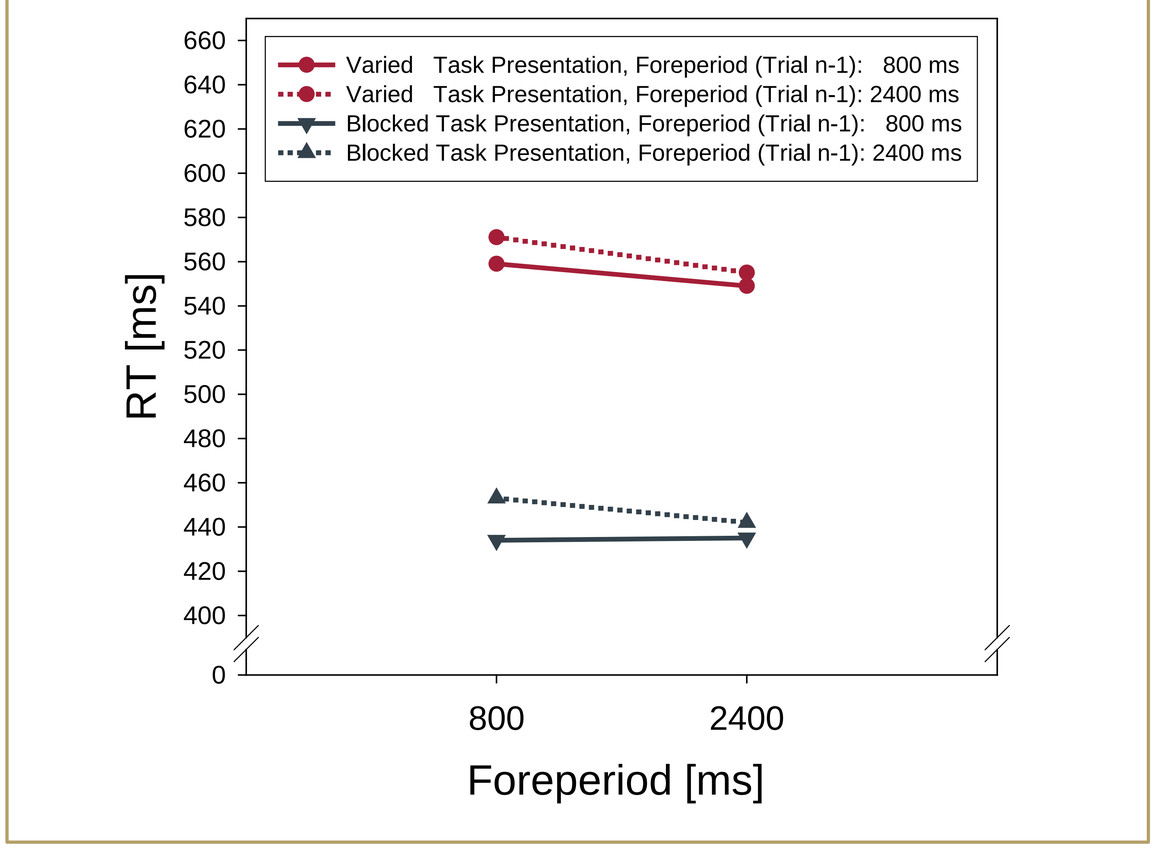

Figure 2: Reaction time

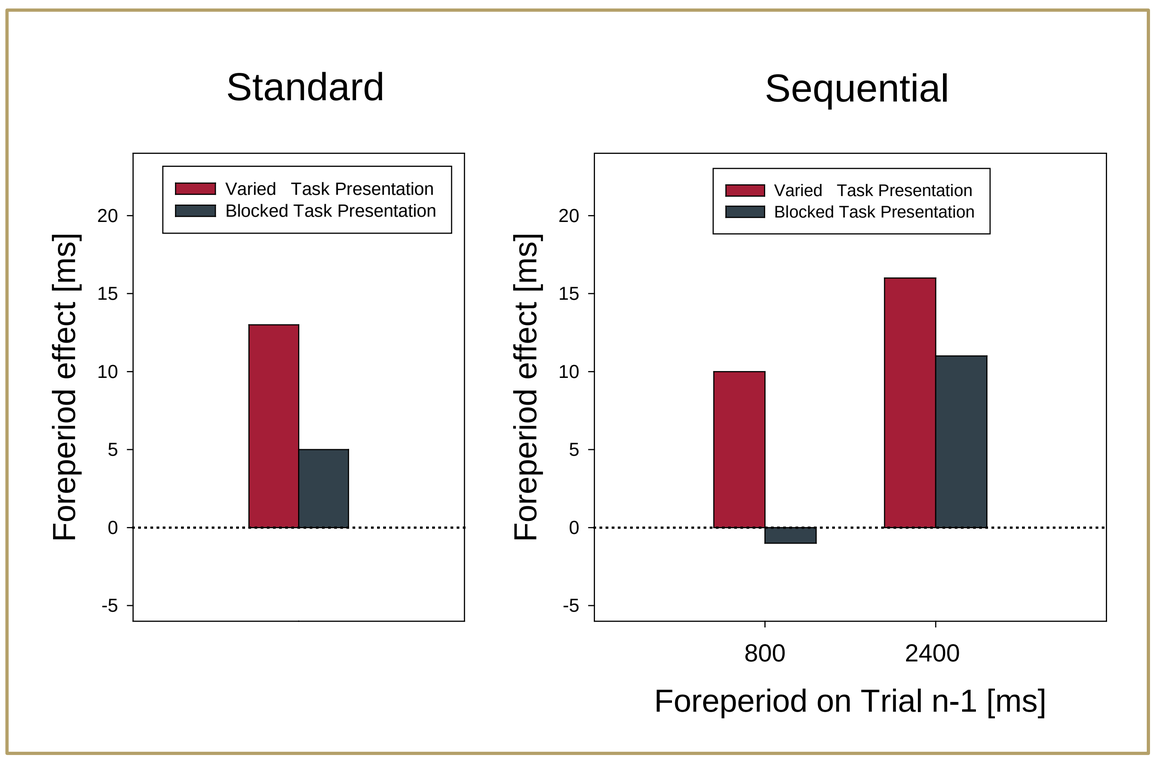

Figure 3: Standard and sequential foreperiod effects

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