

# Language processing under conditions of high workload

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## **Abstract**

An essential task of members of professional teams in high-risk environments, e.g., a nuclear power plant or cockpit, is verbal communication in order to co-ordinate, monitor and control actions referring to human-machine-interaction. High workload situations may cause language processing deficits and thus affect communicative performance enhancing the risk of errors. In a dual-task situation, two different question answering tasks (yes/no vs. wh-) were combined with two different high priority continuous unstable tracking tasks. Task-load was varied by changes of time and accuracy demands in the tracking task. First results indicate a higher vulnerability of answering performance for wh-questions in high task-load situations. Processing of wh-questions implies linguistic procedures which interfere more strongly with additional task-load than those needed to process y/n-questions.

## **Introduction**

Teams in high-risk environments normally communicate verbally in order to control and to coordinate their actions. A basic communicative act is asking with the goal of receiving an answer. Answers may help both questioner and addressee to update their knowledge, to plan and to reflect upon their actions. Answers can and will, however, sometimes be wrong. Two distinct linguistic forms of asking are yes/no (y/n) and who, what, why, where, and how (wh-) questions. Psycholinguistic models of speech production (Levelt, 1989) claim that there are different answer processing modes for different question types. It can accordingly be expected that answer processing of different question types may differ in terms of cognitive expenditure as is suggested by the semantic description of question meaning. Whether these differences in question types correspond with task-load induced vulnerability of language processing in order to give a correct answer has never been tested. Here, results are reported of an experiment designed to test whether the latency and the quality of provided answers to y/n- and wh-questions varies under different task-load levels. This may help to understand how language processing interacts with other activities and provide useful indications for communication failures under high workload.

In D. de Waard, K.A. Brookhuis, S.M. Sommer, and W.B. Verwey (2003), *Human Factors in the Age of Virtual Reality* (pp. 275 - 279). Maastricht, the Netherlands: Shaker Publishing.