

On the Development of the Eye Movement Conflict Detection Test

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Pilots and air traffic controllers work in an environment where safety is highly relevant. Therefore, pilot and air traffic controller applicants pass through a multiple-stage selection process with several tests, including cognitive ability tests. Their test performance is usually assessed based on the number of correct answers, incorrect answers, and reaction times. These variables, however, provide only an indirect measure for visual attention, whereas eye tracking has the potential to estimate visual attention more directly. There is currently no cognitive selection test that uses eye movements as an indicator for psychological test performance. The role of eye tracking in the selection process needs to be examined. The computer-based Eye Movement Conflict Detection Test, which provides tasks in the context of aviation, was designed for this purpose. Here, first results from 251 applicants for pilot training or air traffic control training were presented. Participants had to detect potential conflicts between two aircraft as fast and accurately as possible and mark them via touch input. The 82 tasks contained conflicts equally distributed over a given sector. Applicants felt motivated to work on the test after finishing the regular test program of the first stage of the selection procedure. Item and test characteristics were analyzed. Items were selected using item analysis, leading to a final version with 50 tasks. Reliability analysis showed an adequate level of internal consistency for the conflict detection rate and task processing time. Results indicated that the Eye Movement Conflict Detection Test can be applied in eye tracking studies.