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Research article

Reliability of the Dynavision™ D2 for Assessing Reaction Time Performance

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ABSTRACT

Recently, the Dynavision™ D2 Visuomotor Training Device (D2) has emerged as a tool in the assessment of reaction time (RT); however, information regarding the reliability of the D2 have been limited, and to date, reliability data have been limited to non- generalizable samples. Therefore, the purpose of this study was to establish intraclass correlation coefficients ($ICC_{2,1}$) for the D2 that are generalizable across a population of recreationally active young adults. Forty-two recreationally active men and women (age: 23.41 ± 4.84 years; height: 1.72 ± 0.11 m; mass: 76.62 ± 18.26 Kg) completed 6 trials for three RT tasks of increasing complexity. Each trial was separated by at least 48-hours. A repeated measures ANOVA was used to detect differences in performance across the six trials. Intraclass correlation coefficients ($ICC_{2,1}$) standard error of measurement (SEM), and minimal differences (MD) were used to determine the reliability of the D2 from the two sessions with the least significant difference score. Moderate to strong reliability was demonstrated for visual RT ($ICC_{2,1}$: 0.84, SEM: 0.033), and reactive ability in both Mode A and Mode B tasks (Mode A hits: $ICC_{2,1}$: 0.75, SEM: 5.44; Mode B hits: $ICC_{2,1}$: 0.73, SEM: 8.57). Motor RT ($ICC_{2,1}$: 0.63, SEM: 0.035s) showed fair reliability, while average RT per hit for Modes A and B showed moderate reliability ($ICC_{2,1}$: 0.68, SEM: 0.43 s and $ICC_{2,1}$: 0.72, SEM: 0.03 s respectively). It appears that one familiarization trial is necessary for the choice reaction time (CRT) task

while three familiarization trials are necessary for reactive RT tasks. In conclusion, results indicate that the Dynavision™ D2 is a reliable device to assess neuromuscular reactivity given that an adequate practice is provided. The data presented are generalizable to a population of recreationally active young adults.

Key words: Assessment, visual, motor, choice reaction time

Key Points

- The Dynavision™ D2 is a light-training reaction device, developed to train sensory motor integration through the visual system, offering the ability to assess visual and motor reaction to both central and peripheral stimuli, with a capacity to integrate increasing levels of cognitive challenge.
- The Dynavision™ D2 is a reliable instrument for assessing reaction time in recreationally active young adults.
- It is recommended that one familiarization trial is necessary for the choice reaction time task assessment to learn the test protocol, while three familiarization trials are needed for reactive ability in Mode A and Mode B before a subsequent reliable baseline score can be established.
- Significant training effects were observed for all reaction time tests and should be taken into account with continuous trials.