

BrainHQ

BrainHQ includes 29 cognitive exercises (i.e., Divided Attention, Double Decision, Freeze Frame, Mixed Signals, Target Tracker, Eye for Detail, Fine Tuning, Hawk Eye, Sound Sweeps, Visual Sweeps, Auditory Ace, Card Shark, Juggle Factor, Mind Bender, Hear-Hear, Memory Grid, Mind's Eye, Rhythm Recall, Scene Crasher, Syllable Stacks, To-Do List Training, Mental Map, Optic Flow, Right Turn, True North, Face Facts, Face to Face, In the Know, Recognition) distinguished into 6 categories (i.e., Attention, Brain Speed, Intelligence, Memory, Navigation, People Skills) adjusted to the participant's level of competence. BrainHQ exercises are designed to improve various aspects of cognitive function through targeted brain training. Some key features of the exercises are:

1. **Memory:** Exercises that focus on improving both short-term and long-term memory by challenging users to recall information and recognise patterns.
2. **Attention:** Activities that enhance the ability to concentrate and maintain focus on tasks, which can help in everyday situations requiring sustained attention.
3. **Processing Speed:** Tasks that aim to increase the speed at which the brain processes information, which is crucial for quick thinking and decision-making.
4. **Problem-Solving:** Exercises that involve logical reasoning and strategic thinking to solve complex problems, enhancing critical thinking skills.
5. **Navigation:** Activities that improve spatial memory and navigation skills, useful for orientation and understanding spatial relationships.
6. **People Skills:** Exercises designed to enhance social cognition, including recognizing emotions and understanding social cues, improving interactions with others.

Each exercise adapts to the user's performance level, ensuring the challenges are appropriate and stimulating, promoting continuous cognitive growth.

Supplementary Figure 1 shows the BrainHQ platform's environment and exercises for A. Memory, B. Attention, C. Brain Speed, D. Intelligence, E. Navigation and F. People Skills.

[Place Supplementary Figure 2 here]

Figure 1. A. Memory training. B. Attention training. C. Brain Speed training. D. Intelligence training. E. Navigation training. F. People skills training.

Supplementary Figures 2-5 show how BrainHQ enables users to monitor their progress by displaying a detailed performance history for each exercise level. This feature enables individuals to track completed exercises, monitor progress through various levels, and observe performance improvements over time. Each exercise includes a progress bar that provides real-time feedback on the user's score, showing the number of stars earned at a specific level and the remaining trials. The number of correct trials required to earn the next star varies for each exercise, depending on the task's difficulty.

[Place Supplementary Figure 3 here]

Figure 2. A. An illustration of the days a participant has trained. B. A map of a participant's training progress. It shows how many different exercise levels the participant completed and how much training was done in each. The darker the colour, the more times a level was achieved. C. The table shows the percentile score in each category. This compares the participant's performance to others. The map on the right illustrates the participant's training performance. The darker the colour, the better the participant has done in an exercise or training category. D. A map of the stars earned. The larger the dot, the more star a participant has earned at that level.