



CogniFit Assessment Battery

Validity, tasks and variables description of CogniFit
assessments

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Background

This document describes the features of the assessments available on the CogniFit platform. The aim of these assessments is to know the state of the different cognitive areas of the user, as well as the risk of suffering from certain pathologies or other data of interest.

Each CogniFit assessment is made up of different tasks, and each of these tasks can measure different variables. Therefore, one task may measure a different number of variables depending on the user's actions. The tasks ratings or scores are stored and used for the skills calculations.

This document will allow the user to understand the characteristics, differences, and interpretation of the CogniFit assessments. The following sections contain information about the types of CogniFit assessments, tasks and skills relevant for any type of user.

The user can contact to the support team of CogniFit for more information at support@cognifit.com.

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CogniFit Assessments

Assessment Description

Below is a detailed explanation on how the measurement and automatic scoring process operates.

- All of the assessments are made up of two parts:
 - A symptoms questionnaire and other relevant information.
 - Online task batteries: Each task measures one or multiple cognitive skills.
- The CogniFit program, during the questionnaire, will record the answers and during the assessment, it will measure the results based on variables like time, accuracy, or distance.
- These types of variables are calculated through tasks. When the user completes a task, the program sends a series of previously calculated variables to create numeric data.
- If you are using another CogniFit platform such as Family, Professional, Researchers and/or Schools, when assigning the assessment license, you will be able to decide who will answer the questionnaire: either you or (depending on the initial chosen platform) your family member, patient, participant and/or student.
- Once the assessment is complete, CogniFit sophisticated algorithms calculate the user's results. These results are captured in an automated and detailed report, compiling the user's cognitive strengths and weaknesses.
- The report organizes the quantitative information and presents it in easily explained graphs.

Characteristics of the assessments

- The assessment will last about 15-40 minutes. The time it takes depends on the number of tasks of the evaluation as well as the user's characteristics, rhythm, etc.
- CogniFit assessments are designed for users of all ages, however a minimum age of 7 is required.
- If you are using another CogniFit platform such as Family, Professional, Researchers and/or Schools, you should be aware and conscious of the user's personal characteristics. Not all users have the same physical, mental, or sociocultural characteristics, which may considerably influence the assessment. For example, native language, experience, socio-economic level, mobility, age, or cognitive ability are some examples of personal characteristics that should be taken into account.
- When purchasing an assessment license, on another CogniFit platform such as Family, Professional, Researchers and/or Schools, you will be entitled to apply the assessment of your choice only once and to a single person.

Types of Assessments

CogniFit offers different assessments: A general cognitive assessment, a driving assessment and other specific assessments that measure cognitive skills that may indicate the possible symptoms of a pathology.

CogniFit scientific team is working hard to provide more cognitive assessments to evaluate a broader range of pathologies.

The state of cognitive abilities may vary depending on the user, their experiences or alterations. CogniFit has studied which cognitive areas (whether attention, perception, memory, executive functions or coordination) are most frequently affected in each pathology. Therefore, cognitive skills tested will vary according to the pathology.

Each variable, that is stored in the CogniFit databases for the skills calculation, is measured and sent by a task.

General Cognitive Assessment Battery (CAB)

The General Cognitive Assessment consists of 16 tasks and a battery of questions related the user's well-being.

The tasks section measures 22 cognitive abilities, while the questionnaire section measures three areas of well-being: physical well-being, psychological well-being and social well-being.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the General Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

General Cognitive Assessment (CAB)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Processing Test (REST-INH): Numbers and Shapes Sequencing Test (WOM-ASM): The Numbers Estimation Test (EST-II): Musical Notes Synchronization Test (UPDA-SHIF): Follow the Ball Programming Test (VIPER-PLAN): The Mazes Recognition Test (WOM-REST): Three Shapes Equivalencies Test (INH-REST): Colors and Words Coordination Test (HECOOR): The ball Concentration Test (VISMEM-PLAN): Glowing Circles Decoding test (VIPER-NAM): The Letters Identification Test (COM-NAM): Objects Seen or Heard Before Inquiry Test (REST-COM): Pictures and Words Estimation Test (EST-I): Fast and Curious Simultaneity Test (DIAT-SHIF): The Ball and The Colors	Auditory Perception Auditory Short-term Memory Contextual Memory Divided Attention Estimation Hand-eye Coordination Focus Inhibition Naming Planning Processing Speed Recognition Response Time Shifting Short-term Memory Spatial Perception Updating Non-verbal Memory Visual Perception Visual Scanning Visual Short-term Memory Working Memory

Dyslexia Cognitive Assessment Battery (CAB-DX)

The Dyslexia Cognitive Assessment consists of 9 tasks and a questionnaire related to the user's dyslexia symptoms.

The tasks section measures 10 cognitive abilities, while the questionnaire section measures different areas of dyslexia symptoms depending on the user's age:

- Children 7-12 years-old: Reading and writing problems, learning and development problems, and psychomotricity and skills problems.
- Teens 13-17 years-old: Reading and writing problems, learning and development problems, problems with psychomotricity and spatial skills, and problems with social relationships.
- Adults 18+ years-old: Reading and writing problems, trouble with professional and social areas, academic history, and spatial and temporal organization.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Dyslexia Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Dyslexia Cognitive Assessment (CAB-DX)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Concentration Test (VISMEM-PLAN): Glowing Circles Decoding test (VIPER-NAM): The Letters Identification Test (COM-NAM): Objects Seen or Heard Before Sequencing Test (WOM-ASM): The Numbers Programming Test (VIPER-PLAN): The Mazes Recognition Test (WOM-REST): Three Shapes Simultaneity Test (DIAT-SHIF): The Ball and The Colors	Divided attention Focus Naming Planning Processing Speed Response Time Short-term Memory Visual Scanning Visual Short-term Memory Working Memory

Dyscalculia Cognitive Assessment Battery (CAB-DC)

The Dyscalculia Cognitive Assessment consists of 11 tasks and a battery of questions related to the user's dyscalculia symptoms.

The tasks section measures 9 cognitive abilities, while the questionnaire section measures different areas of dyscalculia symptoms depending on the user's age:

- Children 7-17 years-old: Mathematical language, mathematical reasoning, social relationships, and learning and development.
- Adults 18+ years-old: Mathematical language, mathematical reasoning, academic history, professional and social areas.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Dyscalculia Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Dyscalculia Cognitive Assessment (CAB-DC)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle	Divided Attention Focus Naming Planning Processing Speed Recognition Response Time Short-term Memory Working Memory
Resolution Test (REST-SPER): Circles and Hexagons	
Concentration Test (VISMEM-PLAN): Glowing Circles	
Decoding test (VIPER-NAM): The Letters	
Identification Test (COM-NAM): Objects Seen or Heard Before	
Sequencing Test (WOM-ASM): The Numbers	
Recognition Test (WOM-REST): Three Shapes	
Coordination Test (HECOOR): The ball	
Processing Test (REST-INH): Numbers and Shapes	
Inquiry Test (REST-COM): Pictures and Words	
Simultaneity Test (DIAT-SHIF): The Ball and The Colors	

ADHD Cognitive Assessment Battery (CAB-ADHD)

The Attention Deficit Hyperactive Disorder Cognitive Assessment consists of 12 tasks and a battery of questions related to the user's ADHD symptoms.

The tasks section measures 7 cognitive abilities, while the questionnaire section measures different areas of ADHD symptoms depending on the user's age:

- Children 7-12 years-old: Hyperactivity and impulsiveness, inattention, problems with social relationships, and learning and development.
- Teens 13-17 years-old: Hyperactivity and impulsiveness, inattention, poor social skills, and learning and development.
- Adults 18+ years-old: Hyperactivity and impulsiveness, inattention, academic history, and difficulties in professional or social areas.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the ADHD Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

ADHD Cognitive Assessment (CAB-ADHD)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Concentration Test (VISMEM-PLAN): Glowing Circles Decoding test (VIPER-NAM): The Letters Identification Test (COM-NAM): Objects Seen or Heard Before Sequencing Test (WOM-ASM): The Numbers Equivalencies Test (INH-REST): Colors and Words Coordination Test (HECOOR): The ball Processing Test (REST-INH): Numbers and Shapes Inquiry Test (REST-COM): Pictures and Words Simultaneity Test (DIAT-SHIF): The Ball and The Colors Synchronization Test (UPDA-SHIF): Follow the Ball	Hand-eye Coordination Focus Inhibition Planning Short-term Memory Visual Perception Working Memory

Depression Cognitive Assessment Battery (CAB-DP)

The Depression Cognitive Assessment consists of 10 tasks and a battery of questions related to the user's depression symptoms.

The tasks section measures 12 cognitive abilities, while the questionnaire section measures three areas of depression symptoms: emotional symptoms, physical symptoms and associated symptoms.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Depression Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Depression Cognitive Assessment (CAB-DP)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Concentration Test (VISMEM-PLAN): Glowing Circles Synchronization Test (UPDA-SHIF): Follow the Ball Identification Test (COM-NAM): Objects Seen or Heard Before Sequencing Test (WOM-ASM): The Numbers Recognition Test (WOM-REST): Three Shapes Coordination Test (HECOOR): The ball Processing Test (REST-INH): Numbers and Shapes Simultaneity Test (DIAT-SHIF): The Ball and The Colors	Hand-eye Coordination Focus Inhibition Planning Processing Speed Response Time Shifting Short-term Memory Spatial Perception Updating Visual Perception Working Memory

Driving Cognitive Assessment Battery (CAB-DR)

The Driving Cognitive Assessment consists of 10 tasks and a battery of questions related to the user's safety driving characteristics.

The tasks section measures 12 cognitive abilities, while the questionnaire section measures three areas of safety driving characteristics: regulations and roadway compliance, motivation and drive style.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Driving Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Driving Cognitive Assessment (CAB-DR)	
Tasks	Cognitive Skills
Precision Test (COOR): The Winding Track Exploration Test (SCAVI-REST): Jumbled Letters Estimation Test (EST-I): Fast and Curious Estimation Test (EST-II): Musical Notes Inattention Test (FOCU-SHIF): Four Corners Estimation Test (EST-III): Perspectives and Distances Exactitude Test (REST-COOR): The Tricky Track Preferences Test (INH): Favorite Paintings Recovery Test (VISMEM): Scene Recall Visual Capacity Test (WIFIVI): The Shape in the Middle	Divided Attention Estimation Hand-eye Coordination Focus Inhibition Obedience to Rules Response Time Risk Avoidance Shifting Visual Scanning Visual Short-term Memory Width of Field of View

Parkinson's Cognitive Assessment Battery (CAB-PK)

The Parkinson's Cognitive Assessment consists of 14 tasks and a battery of questions related to the user's Parkinson's symptoms.

The tasks section measures 11 cognitive abilities, while the questionnaire section measures four areas of Parkinson's symptoms: Motricity and movement, mental state, sleep and language.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Parkinson's Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Parkinson's Cognitive Assessment (CAB-PK)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Concentration Test (VISEM-PLAN): Glowing Circles Synchronization Test (UPDA-SHIF): Follow the Ball Identification Test (COM-NAM): Objects Seen or Heard Before Sequencing Test (WOM-ASM): The Numbers Recognition Test (WOM-REST): Three Shapes Decoding test (VIPER-NAM): The Letters Coordination Test (HECOOR): The ball Processing Test (REST-INH): Numbers and Shapes Simultaneity Test (DIAT-SHIF): The Ball and The Colors Estimation Test (EST-II): Musical Notes Estimation Test (EST-I): Fast and Curious Estimation Test (EST-III): Perspectives and Distances	Contextual Memory Divided Attention Estimation Focus Planning Processing Speed Response Time Short-term Memory Updating Visual Perception Working Memory

Chemo Fog Cognitive Assessment Battery (CAB-CF)

The Chemo Fog Cognitive Assessment consists of 8 tasks and a battery of questions related to the user's chem fog symptoms.

The tasks section measures 7 cognitive abilities, while the questionnaire section measures three areas of chemo fog symptoms: emotional symptoms, physical symptoms, and chemo fog symptoms.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Chemo Fog Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Chemo Fog or Chemo Brain Cognitive Assessment (CAB-CF)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Concentration Test (VISEM-PLAN): Glowing Circles Identification Test (COM-NAM): Objects Seen or Heard Before Sequencing Test (WOM-ASM): The Numbers Recognition Test (WOM-REST): Three Shapes Processing Test (REST-INH): Numbers and Shapes Simultaneity Test (DIAT-SHIF): The Ball and The Colors	Focus Planning Recognition Response Time Short-term Memory Updating Working Memory

Insomnia Cognitive Assessment Battery (CAB-IN)

The Insomnia Cognitive Assessment consists of 11 tasks and a battery of questions related to the user's insomnia symptoms.

The tasks section measures 8 cognitive abilities, while the questionnaire section measures three areas of insomnia symptoms: insomnia symptoms, sleep and associated symptoms.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Insomnia Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Insomnia Cognitive Assessment (CAB-IN)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Concentration Test (VISEM-PLAN): Glowing Circles Identification Test (COM-NAM): Objects Seen or Heard Before Sequencing Test (WOM-ASM): The Numbers Recognition Test (WOM-REST): Three Shapes Coordination Test (HECOOR): The ball Processing Test (REST-INH): Numbers and Shapes Simultaneity Test (DIAT-SHIF): The Ball and The Colors Decoding test (VIPER-NAM): The Letters Inquiry Test (REST-COM): Pictures and Words	Focus Naming Processing Speed Response Time Shifting Short-term Memory Visual Perception Working Memory

Fibromyalgia Cognitive Assessment Battery (CAB-FB)

The General Cognitive Assessment consists of 12 tasks and a battery of questions related to the user's fibromyalgia symptoms.

The tasks section measures 8 cognitive abilities, while the questionnaire section measures three areas of fibromyalgia symptoms: Muscle and joint pain, psychological symptoms and mental state, and associated symptoms.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Fibromyalgia Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Fibromyalgia Cognitive Assessment (CAB-FB)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle	Focus Naming Planning Processing Speed Recognition Response Time Shifting Short-term Memory
Resolution Test (REST-SPER): Circles and Hexagons	
Identification Test (COM-NAM): Objects Seen or Heard Before	
Programming Test (VIPER-PLAN): The Mazes	
Concentration Test (VISMEM-PLAN): Glowing Circles	
Processing Test (REST-INH): Numbers and Shapes	
Synchronization Test (UPDA-SHIF): Follow the Ball	
Coordination Test (HECOOR): The ball	
Equivalencies Test (INH-REST): Colors and Words	
Simultaneity Test (DIAT-SHIF): The Ball and The Colors	
Sequencing Test (WOM-ASM): The Numbers	
Inquiry Test (REST-COM): Pictures and Words	

Academic Cognitive Assessment Battery (S-CAB)

The School or Academic Cognitive Assessment is exclusively available for school accounts. It consists of 14 tasks and a battery of questions in order to bring neuroscientific theory to the academic environment.

The tasks section measures 13 cognitive abilities, while the questionnaire section measures the student's motivation towards school.

In the following table under the "Tasks" column is the task code and the name that will appear during the different tasks of the Academic Cognitive Assessment. The cognitive skills measured in this assessment are under the "Cognitive Skills" column.

Academic Cognitive Assessment (S-CAB)	
Tasks	Cognitive Skills
Speed Test (REST-HECOOR): A Big Circle Resolution Test (REST-SPER): Circles and Hexagons Processing Test (REST-INH): Numbers and Shapes Sequencing Test (WOM-ASM): The Numbers Synchronization Test (UPDA-SHIF): Follow the Ball Programming Test (VIPER-PLAN): The Mazes Recognition Test (WOM-REST): Three Shapes Equivalencies Test (INH-REST): Colors and Words Coordination Test (HECOOR): The ball Concentration Test (VISMEM-PLAN): Glowing Circles Decoding test (VIPER-NAM): The Letters Identification Test (COM-NAM): Objects Seen or Heard Before Inquiry Test (REST-COM): Pictures and Words Simultaneity Test (DIAT-SHIF): The Ball and The Colors	Contextual Memory Divided Attention Hand-eye Coordination Focus Planning Processing Speed Response Time Short-term Memory Spatial Perception Updating Visual Scanning Visual Short-term Memory Working Memory

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Outcome Results

Once the user has finished the whole assessment, which includes the questionnaire and the cognitive tasks, a preview can be seen from user's profile.

- If it is a personal use account the report will be available on the "Assessment section", next to the completed assessment button.
- If it is another CogniFit account, the results will be available only from the main user's profile (parents or guardians, professional, researcher or teacher account). This means that patients, participants, family members and/or students won't receive any feedback unless the main user gives it to them.

The assessment report shows a summary with the main information gathered during the assessment, as shown in the picture below.



LOW COGNITIVE PERFORMANCE

Amy Tate's Results



ASSESSMENT

WELL-BEING INDICATORS

0/22

Low indices of general well-being have been detected.

Optimal range: 14-22
Score: 0

COGNITIVE PROFILE

8/22

Poor cognitive performance has been detected.

Optimal range: 17-22
Score: 8

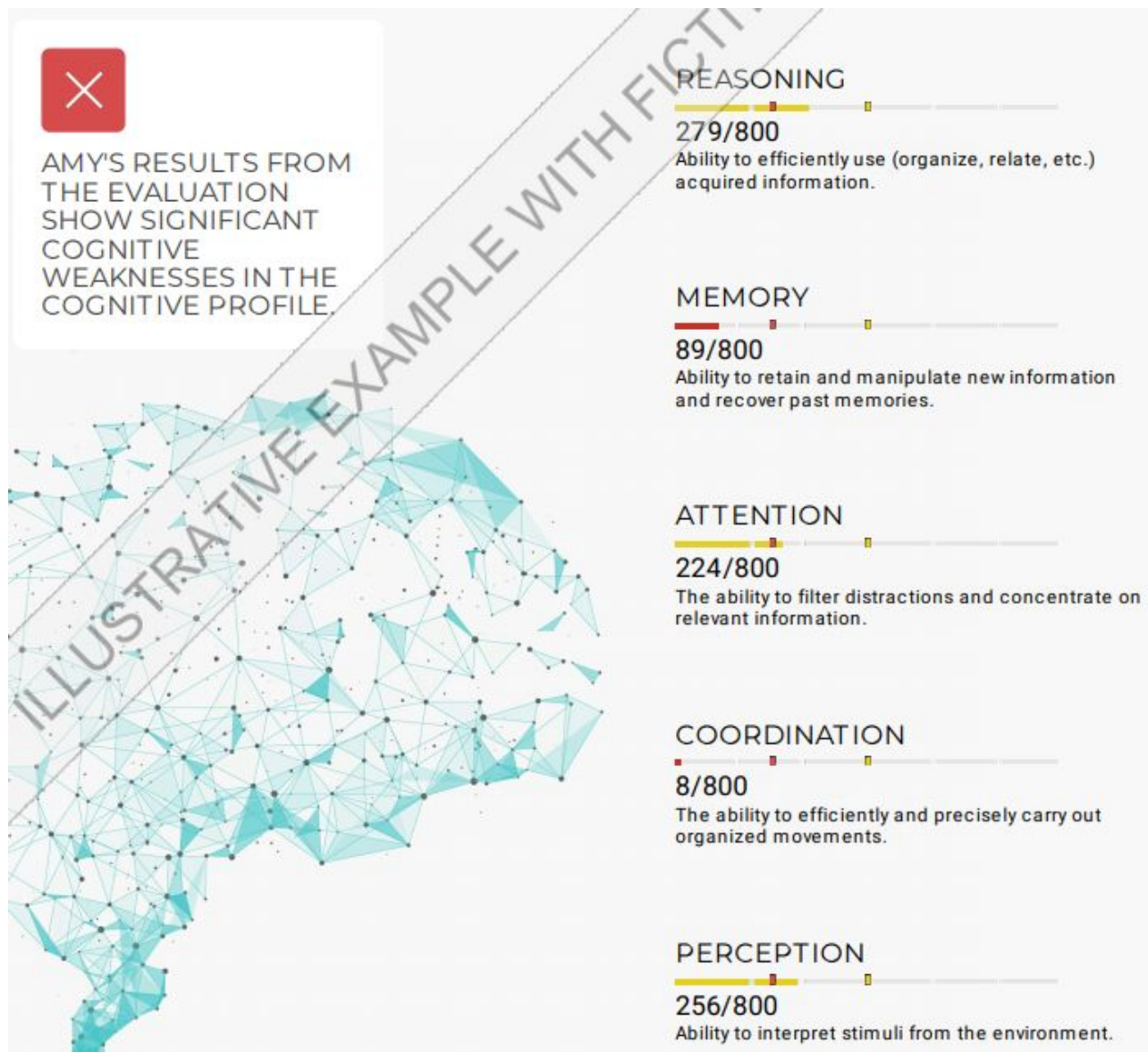
EVALUATED INDICATORS	LOW WELL-BEING	AMY
Physical well-being	0-2	0
Psychological well-being	0-5	0
Social well-being	0-1	0
Cognitive profile	0-10	8



CONCLUSIONS

- Amy should work to improve both cognitive skills and lifestyle choices, as the results of the cognitive assessment indicate that Amy has weakened cognitive skills and unhealthy habits.
- We recommend starting a personalized brain training program from CogniFit.
- Ask about healthy lifestyle habits.

The report will show the user's questionnaire areas and cognitive skills scores. The values of the measured cognitive skills have been calculated by CogniFit, using the variables from the different tasks.



To see a more detailed example, access [this link](#).

To obtain this cognitive data, the CogniFit saves and processes many different variables depending on the task. Although the CogniFit takes into account a large number of variables, there are six main types stored into the databases:

Variable Prefix	Unit of measurement	Description
ACC	%	How close the result is to the correct one. The values oscillates between 0 and 100.
AVG	n/a	Average value of one concrete measurement in a task.
DIST	pixels	Distance between two different items in a task.
EFF	n/a	Response time divided between the correct answers proportion in a concrete task.
MEA	n/a	All kinds of different measurements. Can be a maximum value, a minimum one or any other value depending the task.
RT	milliseconds	Time spent by the user until achieves the objective of one part of the task (or even the whole task).

4

Validity

As previously mentioned, the battery of tasks for each assessment is made up of various tasks that can measure up to 23 cognitive skills. This set of cognitive abilities has been subjected to a standardized measurement control to check validity by using several statistics.

Cronbach's Alpha

To consider the internal consistency and check the compatibility of CogniFit tool, Cronbach's Alpha coefficient was used. This statistic was calculated by using the data from a sample group of over 500 participants. The data was gathered by using the general cognitive assessment tasks and the set of training programs available at CogniFit (www.cognifit.com). Cronbach's Alpha aimed to measure reliability and correlation in each of the cognitive skills.

Results

The data gathered reached over .7 (Table below), indicating that the Alfa score had a high/good internal consistency, according to the criteria specified by George and Mallery (2003, p. 231). These results show that the correlation between the variables is high, and thus good reliability.

Test-Retest

In order to check the reliability of the CogniFit tool as a system, the Test-retest reliability was applied. This test was chosen to prove the stability of the measured data at two specific points in time. This statistic was calculated using the data gathered by other 500 sample users using CogniFit.

Results

The data scored above .8 in more than 50% of the cases, and the retests are between .6 and .7. These results show that CogniFit is accurate and reliable, as the scores are near 1, and therefore there are no discrepancies among the data.

Cognitive Skill	Internal Consistency	Test-Retest Reliability
Shifting	0,726	0,842
Divided Attention	0,866	0,85
Width Field of View	0,806	0,998
Hand-Eye Coordination	0,779	0,876
Naming	0,687	0,782
Focus	1	0,905
Visual Scanning	0,862	0,922
Estimation	0,761	0,986
Inhibition	0,661	0,697
Auditory Short-Term Memory	0,915	0,698
Contextual Memory	0,884	0,775
Visual Short-Term Memory	0,866	0,743
Short-Term Memory	0,853	0,721
Working Memory	0,85	0,696
Non-Verbal Memory	0,787	0,73
Spatial Perception	0,611	0,907
Visual Perception	0,751	0,882
Auditory Perception	0,652	0,904
Planning	0,765	0,826
Reaction To Change	0,571	0,88
Recognition	0,864	0,771
Response Time	0,873	0,821
Processing Speed	0,888	0,764

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