AUGUST 25 2025

YOUR BRAINAGE SCORE

What does the BrainAge score mean?

The BrainAge score is a snapshot of your current brain function, offering insights beyond your chronological age. Derived from your seven-minute scan using the Kernel Flow headset, this score reflects your neurophysiological state at that moment. This score allows you to track your brain function over time and understand how lifestyle factors, training, and other interventions impact your brain health.

What doesn't the BrainAge score mean?

While your BrainAge score offers a peek into your current brain function, it's important to remember that it is an exploratory wellness tool and not a medical diagnosis. A higher BrainAge doesn't automatically mean you have a disease, and a lower one doesn't guarantee you're risk-free. This information is just for informational purposes, giving you a snapshot of your brain function and overall wellness.

The BrainAge score provides insights into your current brain function, it is not a substitute for professional medical advice. Always consult with your medical provider for any health concerns or before making any decisions related to your health or treatment.

What did we do during the measurement?

The BrainAge measurement assesses your brain during its resting or idle state. During this resting state your brain enters a default state of network connections and communication. This allows us to measure your baseline brain function without the influence of external activities.

Why are BrainAge measurements useful?

The long-term value of BrainAge measurements is the ability to track your personal brain function over time. By regularly taking the assessment, you can establish a baseline score and monitor for changes over weeks, months, or years. Empowered with this information, you are able to experiment with various lifestyle interventions that may impact your brain health, such as dietary changes, exercise routines, or cognitive training. Consistent tracking not only can be helpful in identifying early changes in your brain health, but also allows you to make informed adjustments to routines and personalize your wellness journey.

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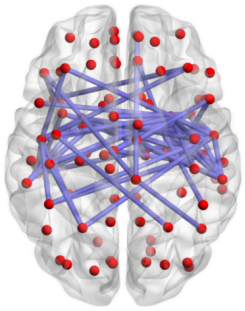
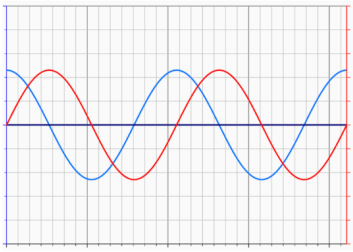
WHAT WE MEASURE

We use 187 characteristics of your brain to calculate your BrainAge score. These include measures of network connectivity, activity oscillations, absolute oxygenation, and other physiological metrics. Below are some additional details about the key metrics in the BrainAge score.

Functional Connectivity

Different parts of your brain are constantly communicating with one another and this activity is quantified as the strength of the communication, or functional connectivity. Assessing the strength of different networks in the brain can provide an indication of overall brain fitness.



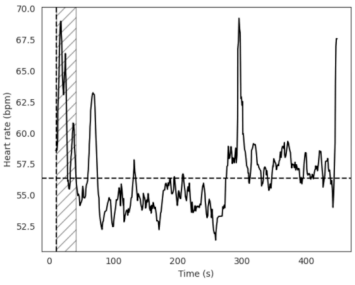


Fractional amplitude of low-frequency fluctuations (fALFF)

Fractional Amplitude of Low-Frequency Fluctuations (fALFF) examines the slow activity underlying your resting state brain activity. We are particularly interested in what percentage of your spontaneous brain activity falls within the low frequency range. This slow activity is another measure that reflects how your brain is wired or organized.

Absolute Oxygenation

Similar to how pulse oximeters measure the oxygenation levels of your blood to assess lung function, we are able to measure the oxygenation levels in your brain tissue. This unique capability provides a peek into your overall neurovascular health. Low levels of absolute oxygenation can be related to poor brain health or other neurovascular risk factors that may impact your long-term wellness.



Physiological Metrics

In addition to the specific brain measures we capture, we are also able to capture global physiological signals related to your heart. It is well understood that cardiovascular health is closely tied to brain health. The BrainAge score includes components like resting heart rate, heart rate variability, and other related metrics. Heart rate variability highlights the balance between the sympathetic and parasympathetic nervous systems, which is also an important marker of neurovascular health.

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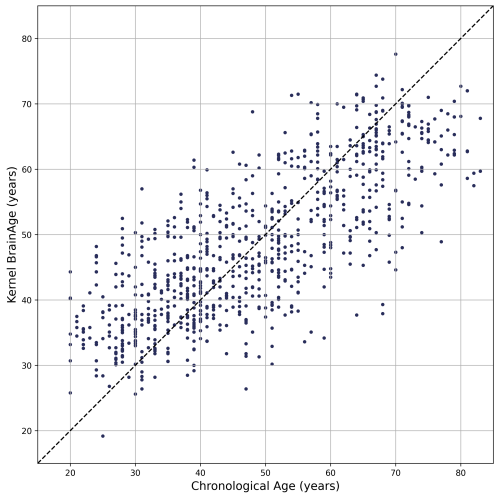
THE SCIENCE

What evidence supports our BrainAge score?

Kernel has recorded resting state brain measurements from more than 500 unique participants, with some people measured multiple times, for a total of about 900 unique datasets. We used this data to train a model to predict each participant's chronological age from their brain data. This model achieves state-of-the-art performance for predicting chronological age when compared to technologies like functional magnetic resonance imaging (fMRI), electroencephalography (EEG), or magnetoencephalography (MEG). Our functional BrainAge model currently has a mean absolute error of 7.6 years and a test-retest reliability of 1.9 years. We are preparing a scientific publication to describe our approach, and will share it soon.



The population-level graph shows the performance of the model for each individual.

What other research has been done on functional brain age?

There is a large and growing body of research on brain age estimation from neuroimaging data. These brain age models are then used to look at the difference between the brain age and the individual's chronological age, a.k.a. their “brain age gap”, or BAG. Researchers are now working to further understand how the BAG relates to different health and wellness outcomes[1].

Like all current functional brain age models, the Kernel BrainAge estimate is known to be biased to older ages for younger participants, and younger ages for older participants[2]. Because of this systematic bias, it is common to interpret the meaning of the functional brain age by assessing the bias-corrected BAG.

REFERENCES

1. Cole, J. H., & Franke, K. (2017). Predicting age using neuroimaging: Innovative brain ageing biomarkers. Trends in Neurosciences, 40(12), 681-690. https://doi.org/10.1016/j.tins.201…

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