How To Optimize Your Training with i3 Mindware Gated DNB

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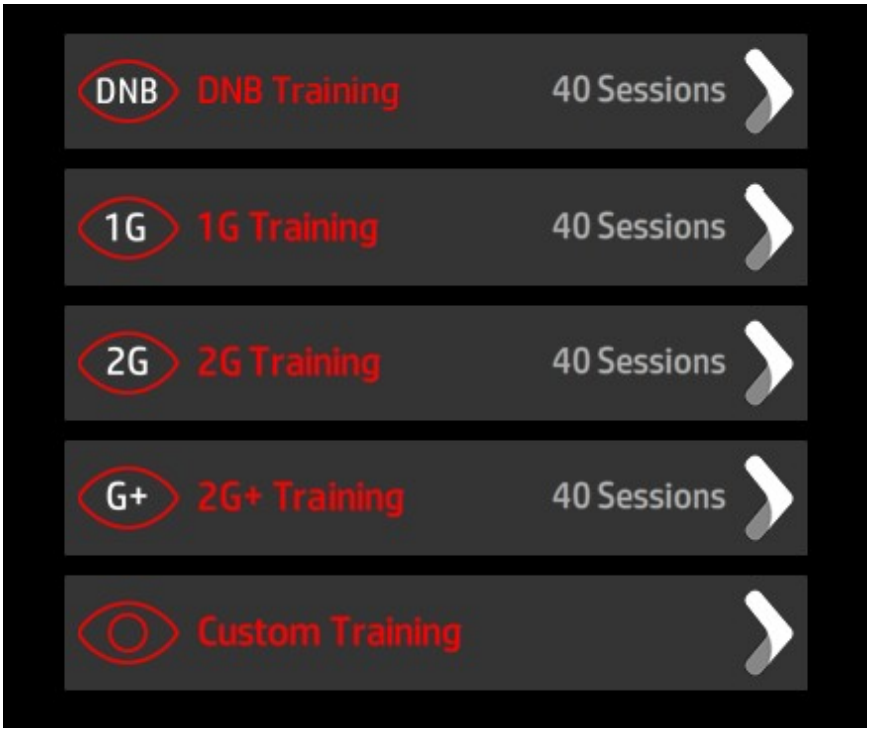
IQ Mindware

1. Which Game Mode?

Before starting your training program, you need to make an important decision: what brain training game to play over the 4-6 weeks of training? **The most critical factor that will determine if you get long term IQ gains is completing the program** - not the type of training game.



If you have no previous training with the classic **dual n-back** (DNB), select that game first. i3 Mindware's dual n-back has built in training for interference control for attention, which improves on the standard dual n-back you can find elsewhere. Ensure you can master this before playing one of the **gated** DNB games. Aim to get to an 'n-back' of 3 consistently to demonstrate mastery. Then choose one of the gated games - **just one** and ensure you complete the 40 Sessions. There is no real extra advantage in terms of the science in doing 2G+

rather than 2G. Both implement the innovative IQ-increase double gating formula that makes this software so special. 2G+ simply adds more variety - but with 2G+ you may find that the performance feedback is less consistent and thus less motivating than with 2G. If double (2G) gating is too demanding for you to complete the program, do 1G training, which is highly effective as well. The science behind i3's Mindware's innovative gated DNB method is explained here.

Remember: completing the basic DNB is more beneficial than just doing half a program in 2G or 2G+!

(Remember, you can always go through a second training program at a more demanding level after completing the first.)

Practice Games

When you select a game mode, you will first be shown a practice game screen with the game concepts you need to ensure you have first mastered before playing. You can practice on any of these games first, and then cancel the training and continue with the actual training game. Simply select 'OK' to move through the practice games.

2. FULL SCALE IQ TEST PROBLEM SETS

If you select to do the Applied IQ Tutorials – which is strongly recommended – you can benefit from i3 Mindware's unique 3-point training method for maximum gains in full-scale IQ.

Mindware Strategies

The term '**mindware**' was first coined by Perkins in his book *Outsmarting IQ: The Emerging Science of Learnable Intelligence*. Mindware refers to *the rules, knowledge, and strategies that aid problem solving*. Mindware is a term for **thinking skills** – your **cognitive toolkit**. i3 Mindware's full scale IQ problem sets will help you work at developing strategies for standard type of IQ test questions.

3. Cognitive Capacity (Gated Dual N-Back Training)

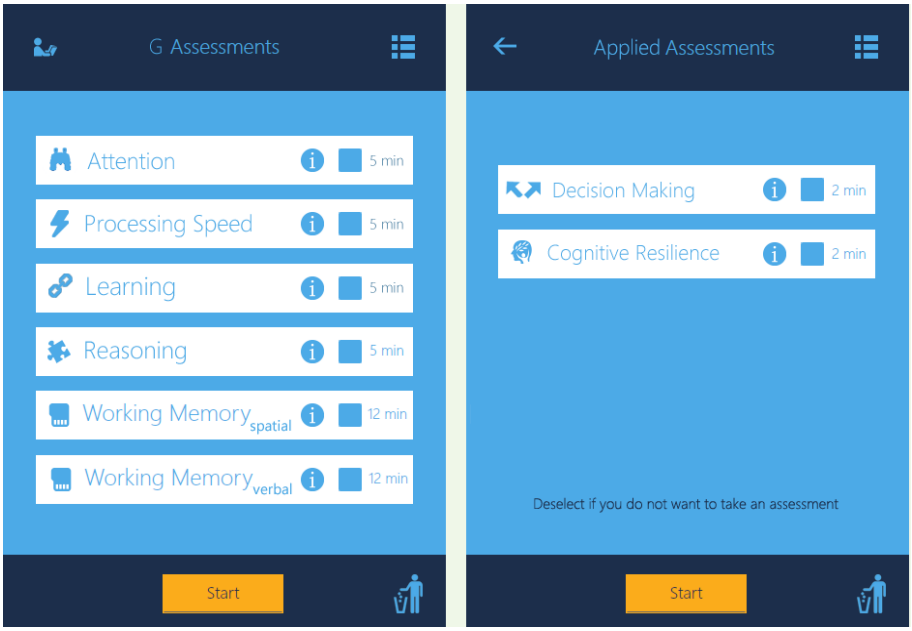
i3 Mindware's gated dual n-back training augments your general **cognitive capacity**:

- The **bandwidth** of the amount of information you can process while thinking something through 'off line'.

- The **efficiency** of deploying your problem solving, decision-making, comprehension, etc.
- Your ability to **override** automatic, reactive processes in your mind and think problems through ‘offline’.
- Your ability to **control your attention**.

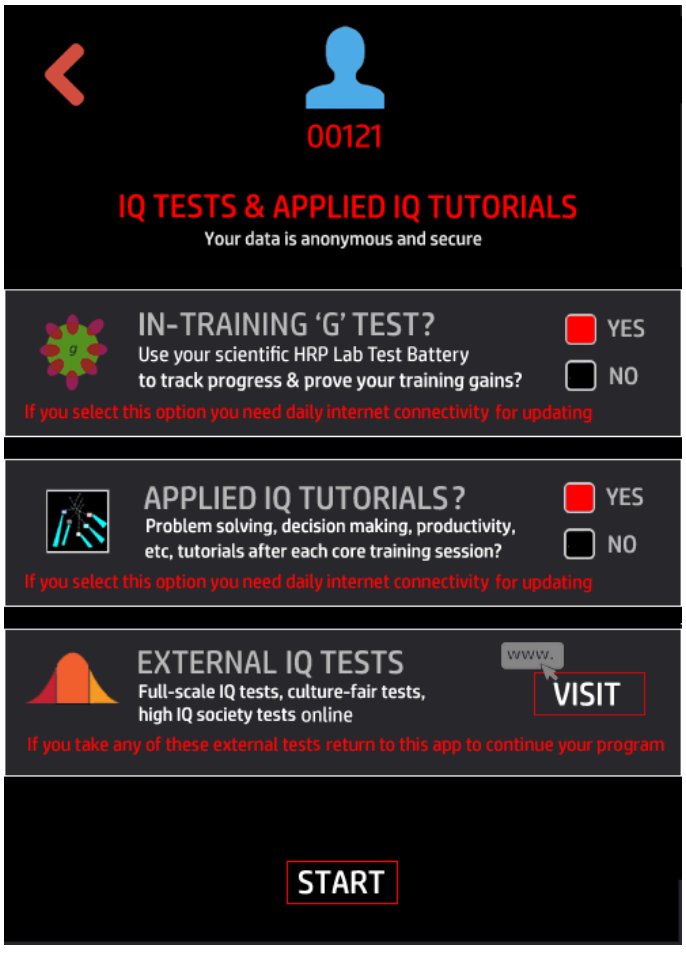
3. What HRP Lab Tests to Use?

The HRP Lab Test app gives you a number of valid, **standardized** psychometric tests. Most are implementations of classic tests in the field of psychological testing. The scores are based on IQ Mindware's user base – not the general public.



What is critical in your test selection is that you **do not over-commit to testing**. You are not obliged to self-quantify your training gains, and you may find it demotivating or time-consuming. You could simply opt to take external valid IQ (fluid reasoning) tests before and after training – such as this IQ test, or this IQ test (take one before and one after).

The first three HRP Lab G tests – attention, processing speed and learning – can be used for **continuous tracking** throughout your training program. You can select or deselect this continuous tracking option when you set up your Profile in the i3 Mindware app here ('In-Training 'G' Test):



If you keep 'In-Training G Test' selected (as the default), every 8 Sessions you will be given the attention, processing speed and learning tests – depending on which ones you selected in the HRP Test Battery app.

If you **deselect** 'In-Training G Test' in the i3 Mindware app, you can still test yourself with the pre and post-training HRP Lab Tests. In this case you will only take the tests you select before and after the full 40 Sessions of training – not any time during training. You may prefer this if you would prefer simply to focus on the training and not on the tracking.

Recommended Test Settings for Minimal Testing

If you want the minimal settings for IQ testing, simply deselect all tests except Processing Speed in the HRP Lab G Test App, and ensure in the i3 Mindware app you have not deselected the 'In-Training G Test' option.

This Processing Speed Test has been found to be a decent, quick-to-administer measure of general intelligence (G).

4. PROGRAM COMPLETION STRATEGIES

The gains guaranteed from i3 Mindware training result from completion of the 40 Session training program.

Not following through with your intentions or commitments is one of the major obstacles for effective brain training. For as long as training programs have been around to improve health or performance, we have been delaying, avoiding, and procrastinating with our training schedules.

This tutorial looks at some of the science behind what the ancient Greek philosophers called *Akrasia* – the failure of will and self-control where we act against our better judgment. The article shares some useful strategies that can help with *Akrasia*, promoting effective brain training.

Akrasia – What Is It?

Akrasia can be defined in terms of two distinct problems:

- **Procrastination** – the irrational delaying of tasks with immediate cost but long-term benefit (e.g. putting off your training today).
- **Instant gratification** – the irrational pursuit of activities with immediate benefit but long-term cost (e.g. web-surfing, rather than training).

What does the science tell us to help explain why we avoid the things we know we should be doing? If we can tease out some underlying causes for this problem, we can start to devise some strategies to counter it.

TIME-INCONSISTENCY

One answer is what psychologists call ‘time inconsistency’ which is our tendency to value immediate rewards more highly than future rewards.

This is illustrated nicely in a famous study on grocery-buying habits: When shopping for groceries online for delivery **tomorrow** we tend to buy a lot more sweet ice cream and a lot fewer healthy vegetables than when we’re shopping for delivery **next week**. Our preferences are inconsistent over time. Our ability to weigh the benefits (yumminess, healthiness) is weakened when we can tap benefits **immediately** and get instant gratification.

A useful way to understand this is by imagining that you have two selves: your Present Self and your Future Self. When you set goals for yourself like completing a 20 Session brain training program, or losing 10 kg of weight or increasing income by $1000— you are envisioning what you want your Future Self to have accomplished.

But long-term rewards are harder to motivate us than short-term rewards. It is far easier for your Present Self to see the value of spending $50 now, than spending $50 or more for the 70-year-old you! And it’s easy to rationalize with your Present Self.

Your Future Self wants to be fit and healthy; your Present Self wants ice cream. But hey, consequences like an increased risk for diabetes or heart failure are years away.

Your Future Self wants to have saved for retirement from your 20s or 30s; your Present Self wants to spend all surplus earnings on holidays. And hey, the benefit of saving is decades off, in an uncertain future.

So what can be done about this glitch in our rationality – this time-based source of *akrasia*?

Self-binding

One technique we can use is a **commitment device**. This is a way of changing one's own incentives to make an otherwise empty longer term promise credible. A classic example is a game of 'chicken' against an opponent, where you e.g. rip the steering wheel out of your car so you can't swerve, thereby increases the chances of winning. With a commitment device you meaningfully constrain your future self's actions. This is one way of making your Present Self as travels through time more consistent with your desired Future Self – more time consistent.

Some common examples from everyday life are the following (from the blog Beeminder):

- Deleting games from your computer so you can't be tempted to play them later.
- Going somewhere without internet access to get work done or using a purposefully handicapped computer. Not having a TV around.
- Using software that stops you from visiting time-wasting sites like Facebook. E.g. LeechBlock or SelfControl for Macs.
- Use a habit tracking app such as Productive that makes your daily actions more accountable, giving you game-like incentives to stick to your commitments on a daily basis.
- Commit to doing something with a friend at a specific time. The cost of skipping the task becomes more compelling – you look like a jerk.

- Make a contract with someone – or a charity – that commits you to forfeiting a significant sum of money if you don't follow through on your goal (such as Beeminder or Stickk)
- Choosing to live somewhere that will force you to walk/bike further. (In theory you could live closer and take a longer route, but you won't.)

Self-binding for effective brain training

- Commit to a certain number of training sessions each week, and use a habit tracking app like Productive to stick to help with that commitment. If you want to be more radical, use Beeminder to forfeit money if you do not keep up with your daily schedule.
- Use social accountability or coaching to motivate you to train with an app such as Coach.me.
- Go somewhere where there is no internet access during your core gated DNB training – or switch the internet off. Remember though - you need the internet for the Tutorials and to update your schedule and performance data.
- Alternatively, use software to stop you visiting time-wasting social media sites when you want to train.
- Remove your TV for the duration of your training, if this absorbs time that conflicts with your training goal.

ACTION THRESHOLDS

It has often been observed that friction that causes procrastination is often centered around **starting** a task, not actually following through with it once you've begun.

Think back to when you've had a deadline for a report or paper. You keep putting it off, even though you experience some guilt and anxiety thinking about it. The emotional cost of putting it off is not enough for you to cross your action threshold earlier – at a time when you should be crossing it. But then...wham: what were more remote future consequences come crashing down on you in the present, and the day before the deadline the pressure 'forces' you to cross the action line, frantically writing that report just hours before it is due!

What is worth observing here is that the emotional pain – the anxiety and guilt – you may feel while procrastinating is often worse than the effort you have to put in while you're working. The problem is not doing the work, it's starting the work.

> *"On a moment-to-moment basis, being in the middle of doing the work is usually less painful than being in the middle of procrastinating."*
>
> **Eliezer Yudkowsky**

So how can we give ourselves a 'nudge' to cross the action-threshold and get relief from the emotional costs of procrastinating, while benefiting from the momentum of the task itself?

1. Temptation-bundling

Temptation-bundling is one method we can use to cross the action-threshold. This concept came out of behavioral economics research undertaken by Katy Milkman at The University of Pennsylvania. She based this research on a personal insight:

> *"I struggle at the end of a long day to get myself to the gym even though I know that I should go. And at the end of a long day, I also struggle with the desire to watch my favorite TV shows instead of getting work done.*
>
> *And so I actually realized that those two temptations, those two struggles I faced, could be combined to solve both problems."*
>
> **Katy Milkman,** Wharton School of Business

By 'bundling' like this, not only did Milkman go to the gym more often, she actually looked forward to going to the gym because it meant that she got to do one of her favorite things – watch her favorite TV shows.

This strategy requires that you bundle a behavior that is gratifying now – for your Present Self – with a behavior that is good for you in the long-term – for your Future Self. In this way it's easier to get started, and the momentum of this commitment may then carry you through.

Here are a few examples from James Clear's blog:

- Only listen to audiobooks or podcasts you love while exercising.
- Only watch your favorite show while ironing or doing household chores.

- Only eat at your favorite restaurant when conducting your monthly meeting with a difficult colleague.

Temptation bundling for effective brain training

You could try any of the following to apply this principle to your brain training program:

- Only drink the coffee you look forward to each day when you are doing a brain training session.
- If you snack regularly, only have food snacks that you love – e.g. ice cream, chocolate, desserts, sweets – when you are doing your brain training session.
- Do your brain training when you are feeling great after a hard workout (this is particularly good for the synergy effect).
- Do your brain training after work when you change clothes and feel relaxed, in your own comfort zone.

2. Habit-building

Another way of crossing the action-threshold to follow through with our intentions is by turning your goals into low-intensity habits.

Our habits account for about 40% of our behaviors on any given day according to this Duke University review. Understanding how current habits work and how to build new ones efficiently is critical for making progress with your health and performance goals.

Dilbert creator Scott Adams argues we need **systems** not goals. 'Systems' are defined as "something you do on a regular basis that increases your odds of happiness in the long run". A 'system' is a habit.

> *"If you do something every day, it's a system. If you're waiting to achieve it someday in the future, it's a goal. [...] ... The systems people are feeling good every time they apply their system. That's a big difference in terms of maintaining your personal energy in the right direction."*
>
> **Scott Adams**

What is needed is a process of **continuous progress** (and the sense of reward that comes from this) through habits rather than a fixation on end states.

Take the example of weight loss. Better than a goal of *"lose 10 pounds in 2 months"* is to have habits in place for living healthier and losing fat like "work out at least 3 times a week" or "skip dinner every other day", or "cut out snacks".

One way of encouraging a habit is the **Don't Break The Chain** hack that became famous with *Lifehacker*'s article 'Jerry Seinfeld's Productivity Secret'. This is the psychological trick of getting yourself to do something every day by looking at the chain of X's for the days in a row you've done it so far. If you build up a nice streak it feels like a shame to break it – so you don't.

The Don't Break the Chain technique is built into the better habit building apps on the market such as Productive for iOS or HabitBull for both iOS and Android. There are many others out there too that you may prefer.

Habit-building for effective brain training

The quickest route to turning brain training goals such as ‘complete the 40 Session course’ into actionable habits, is to make a daily or 5-day habit out of your training, using a habit building and tracking app like Productive or HabitBull.

3. Reducing habit load

If your habits are small and easy to start, then you will be less likely to procrastinate.

One strategy for making habits stick is to break them down into more manageable chunks. James Clear gives the example of the remarkable productivity of the famous writer Anthony Trollope.

> *“He published 47 novels, 18 works of non-fiction, 12 short stories, 2 plays, and an assortment of articles and letters. How did he do it? Instead of measuring his progress based on the completion of chapters or books, Trollope measured his progress in 15-minute increments. He set a goal of 250 words every 15 minutes and he continued this pattern for three hours each day. This approach allowed him to enjoy feelings of satisfaction and accomplishment every 15 minutes while continuing to work on the large task of writing a book.”*

By managing your regular daily activities in this way cultivates an attitude of productivity and success (on your own terms) and helps you maintain momentum over the long-haul, improving the chances of attaining your Future Self ambitions.

Reducing habit-load for effective brain training

The simplest way of reducing habit load for your brain training program is a) starting with simpler games (e.g. Practice sessions) for shorter periods of time until you feel the relevant level of mastery has been attained to do the complete training exercises, and b) break up your daily training into smaller (e.g. half Session) blocks, in order to succeed in completing your training session, and build momentum for your one or two month program.

4. Prioritizing your efforts

Part of a 'systems' approach to seeing through your intentions and being productive is knowing how to prioritize your tasks. Prioritizing is another way of helping us cross our action thresholds.

One simple but effective way of determining priorities and following through with them is using a simple daily tick list. Back in 1918, Charles Schwab (one of the richest men in the world at the time) hired a productivity consultant called Ivy Lee to advise on better ways to boost efficiency. According to the story, Ivy Lee spent 15 minutes with each of the firm's executives and told Schwab that if he saw results, to pay him in three months "for whatever you feel it's worth to you." After this test period, Schwab wrote Lee a check for the equivalent of $400,000 today. Here's what Lee told each executive, now known as the **Ivy Lee Method**:

1. At the end of the day, write down the six most important things that need to be done the following day.

2. Prioritize them by importance.

3. Next day, start on the first and most important task and work on it until it's finished. Work on one task at a time.

4. Do the same for every remaining task on your list. Move any tasks not finished by the end of the day to the next day's task list.

5. Do this every working day.

The Ivy Lee Method is similar to Warren Buffett's 25-5 Rule that requires you to focus on just five critical tasks and ignore everything else.

This tick-list approach can be effective for the following reasons:

- It is simple, robust and easy to apply
- It is highly constrained, eliminating everything but the essential, thus concentrating our time and efforts to get results
- It encourages us to work on one task at a time rather than multi-tasking which is a more efficient way of working
- It is a system which helps build long-term habits
- It provides incentives to cross our action-thresholds

5. Using motivating cues

The apps Productive and Beeminder (and others like them) are not only habit builders but also habit **trackers** – they provide visual feedback in the forms of verbal prompts, graphs and statistics to help us initiate our tasks and visualize our progress over time.

By definition, habits are repetitions of actions that can be initiated without intention and runs to completion with minimal conscious control. Habits are set off automatically by cues and motivating contexts.

The visual cues your habit app with its daily tick list give you can provide just this type of triggering cue. Your technological environment helps nudge you in the right direction, building over time contextual associations that can motivate successful habits. As the visual evidence of your actions accumulates using positive or negative feedback and the 'Don't Break The Chain' strategy you are building more compelling cues to sustain your habits over time. There are a variety of behavioral economics studies that demonstrate a similar effect called the Endowed Progress Effect.

Prioritizing our efforts and using motivating cues for effective brain training

An effective way to enact brain training as a daily (or x times per week) priority and to build brain training as a regular habit is to use the iOS app Productive. HabitBull may work as an Android alternative. *Productive* enables you to implement the Ivy Lee Method or something similar, and provides a rich set of contextual cues and feedback for habit formation and tracking.

5. OPTIMIZING LEARNING : NEUROPLASTICITY

LEARNING: DEFINITION & EXAMPLES

At its most general level, learning is about information processing resulting in structural change. Cutting across psychology, neuroscience, machine learning (AI), organizational psychology and behavioral ecology, learning can be defined as (ref):

> *a structured updating of system properties based on the processing of new information that results in better adaptation, performance or competence*

But for the purposes of brain based learning for practical outcomes, we can define it as (ref):

> *The capacity... to acquire or develop new, memories, knowledge or skills based on experience*

SCIENTIFIC BASIS

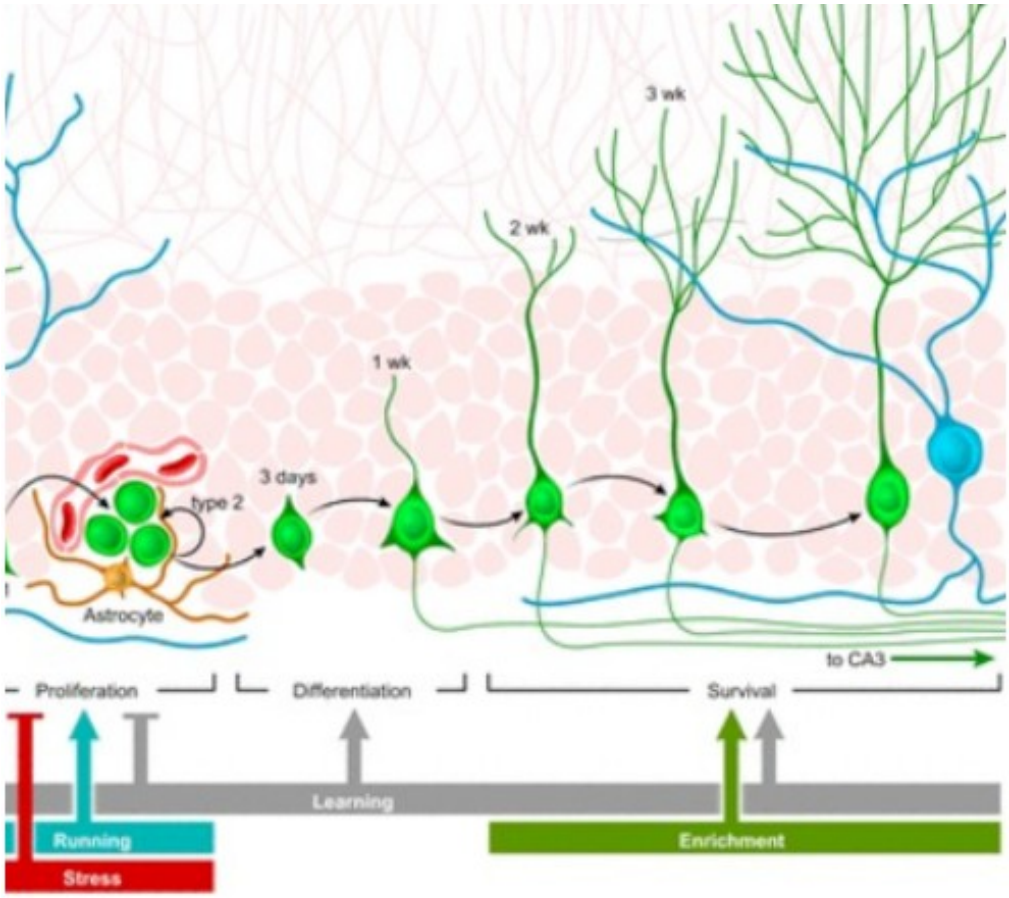
Acquiring complex, cognitively challenging knowledge and skills depends on the birth of new brain cells (**neurogenesis**) in part of the brain called the **hippocampus** (review). There is a daily production of several thousand (e.g. 5000-10,000) new hippocampal neurons; some of these cells will survive and integrate into functional neural circuits as learning occurs, as but within just 2 weeks many will die through programmed cell death.

Different interventions are needed for cell production and cell survival. **Aerobic exercise** can result in a dramatic (e.g. 50%) increase in **brain cell production** in just 2 weeks and four-fold over two months (ref, ref). By contrast **stress** (physical or social) dramatically reduces the amount of new brain cells produced in the hippocampus (ref).

Research indicates that the following conditions are need to be met for optimal **brain cell survival**:

- The learning experience should be between one and two weeks after the birth of the new cells (ref).
- The learning task must be cognitively challenging. Easier tasks do not result in cell survival (ref. Ref).
- The learning process must be successful – there is a strong positive correlation between how well we learn and the number of surviving cells (ref, ref).
- The task-learning must involve sustained effortful / concentration, and that more effort results in more cell survival (ref).

Enriched environments with opportunities for learning, social interaction, exploration, and physical activity – such as you may get on an active, exploratory holiday – also help with brain cell survival (ref)



From Aimone and colleagues' 2014 review of adult neurogenesis (ref)

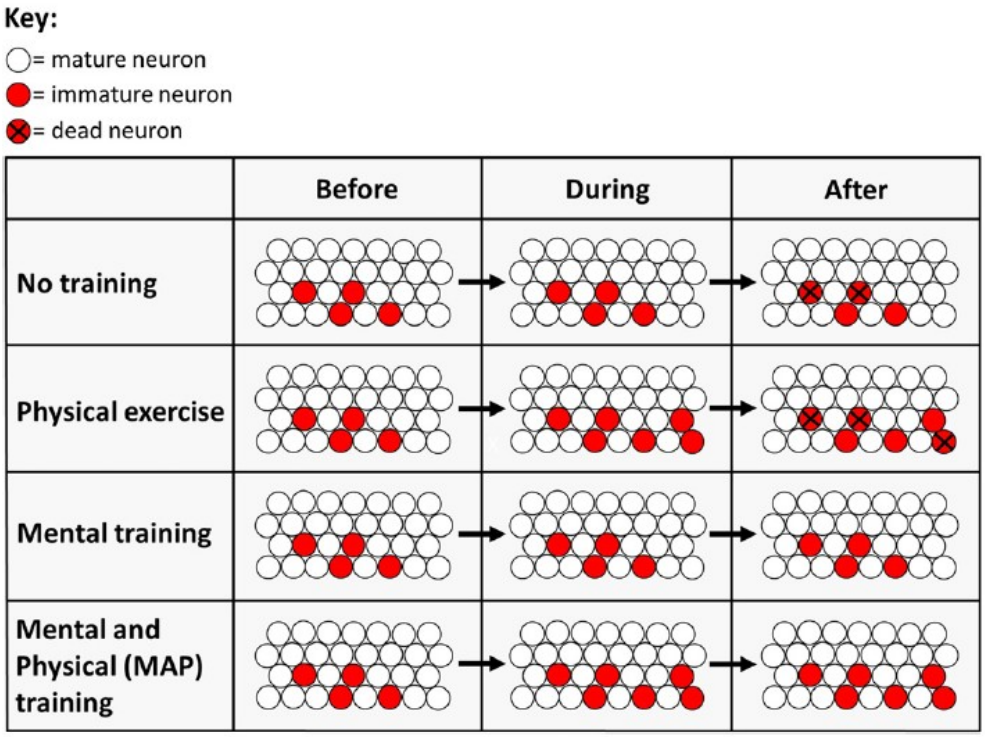
SLEEP

Regular sleep also greatly benefits brain cell survival and the hard-wiring of hippocampal neural circuits that encode our learned skills (ref). Promoting adult hippocampal neurogenesis may be a mechanism by which sleep supports learning

and memory processes. Sleep deprivation disturbs memory formation and negatively modulates hippocampal cell survival (ref). Even mild sleep restriction may interfere with the increase in neurogenesis that normally occurs with hippocampus-dependent learning (ref).

MAP (MENTAL AND PHYSICAL) TRAINING

Combining aerobic exercise for brain cell production with i3 Mindware training for cell survival is a highly effective intervention to attain better long-term IQ-augmenting neuroplasticity.



Gated DNB training improves general information processing capacity. You can then apply this improved capacity to any specific mindware knowledge or skill acquisition. – making sure you experience progress and attain clear benchmarks of mastery. The combination of brain cell production and survival optimizes the learning process greatly. You can start regular i3 Mindware training a week after you start the exercise, but from then on, combine both simultaneously so the two brain-processes of cell production and survival overlap.

MAP training will also benefit substantially from having regular, good quality sleep. Lack of sleep can undermine the advantages of this mental-physical neuroplasticity intervention.

Good luck with your i3 Mindware ulta brain training!